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Jan. 25, 1993 • #105

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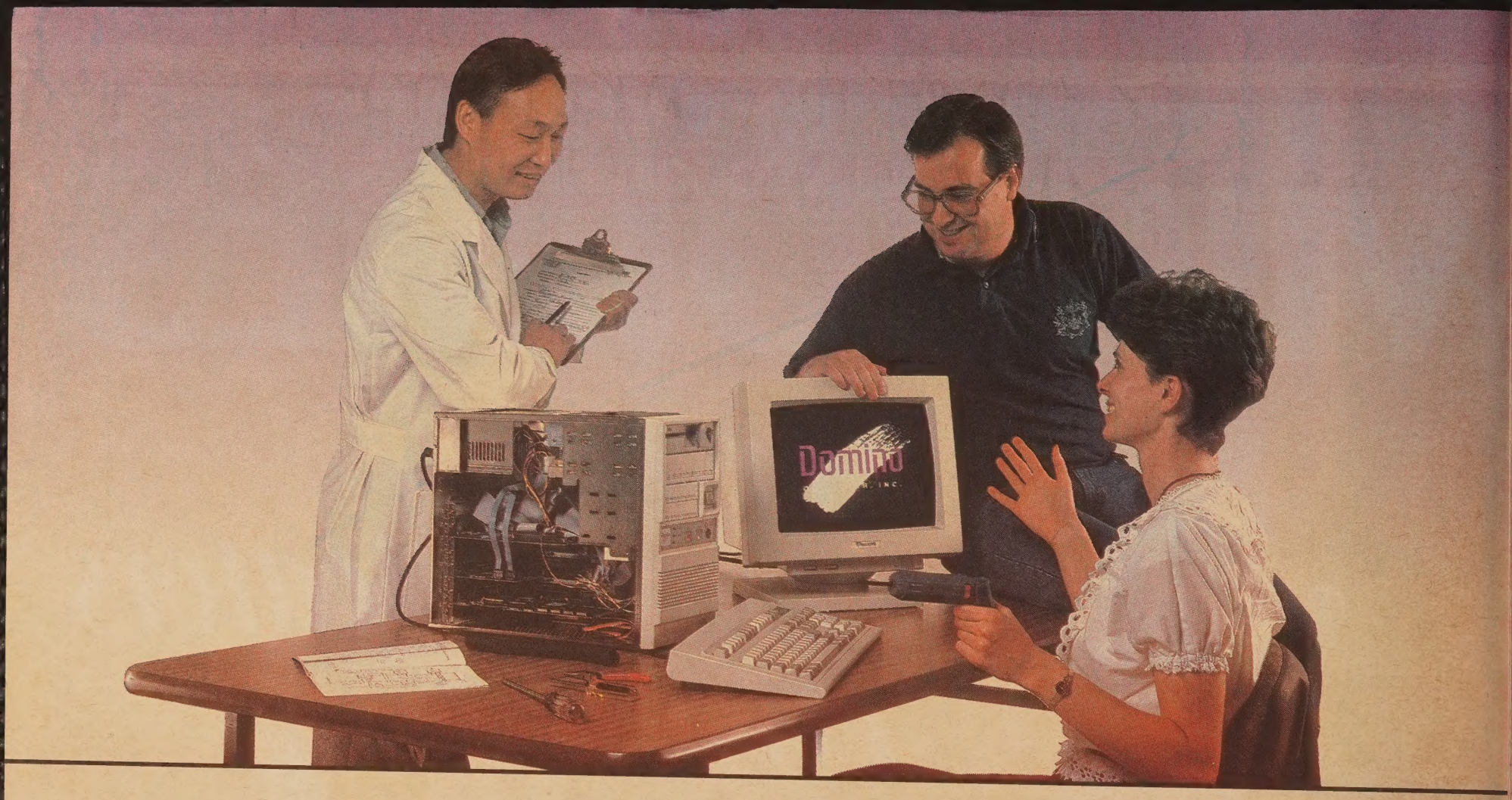

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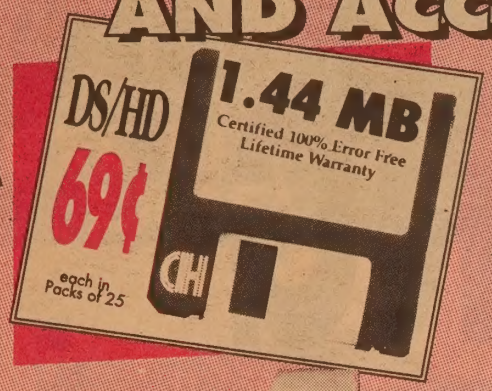

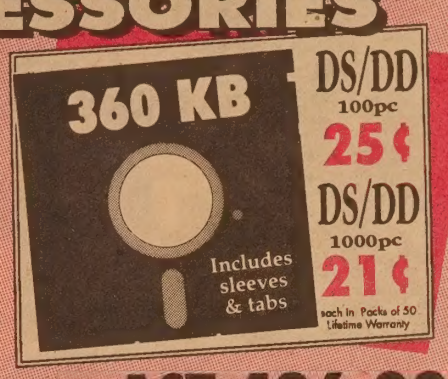

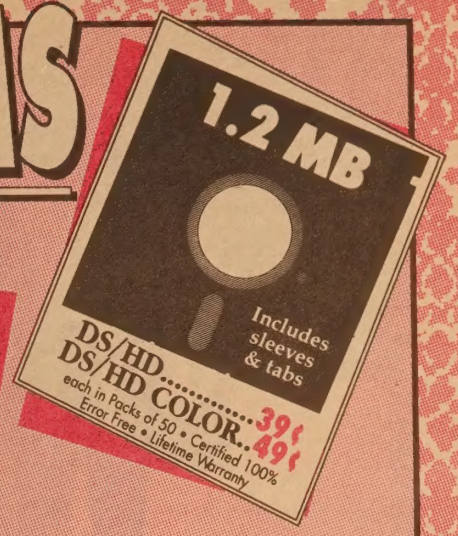

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- Intel Microprocessor
- 64K Cache
- 4 MB Ram
- 120 MB Hard Drive
- 1.2 & 1,44 Floppy Drive
- SVGA 14" Color Monitor (CTX .28 Dot Pitch)
- 1 MB ATI Video Card
- 101 Key Keyboard
- Windows 3.1 & Mouse
- Dos 5.0

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- 256K Cache
- 4 MB Ram
- 120 MB Hard Drive
- 1.2 & 1,44 Floppy Drive
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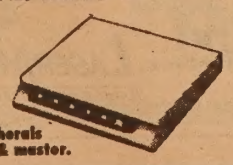

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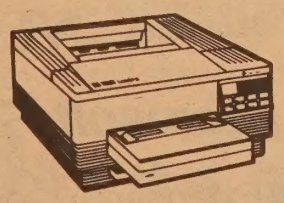

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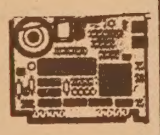

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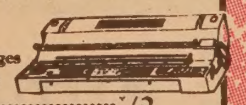

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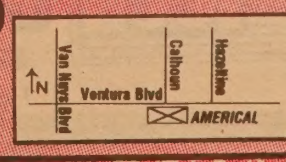

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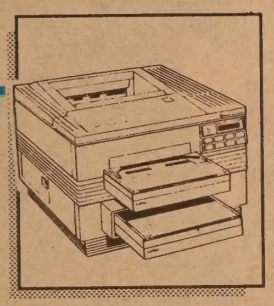

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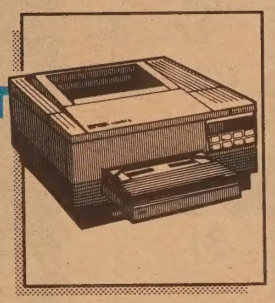

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- 1meg Ram

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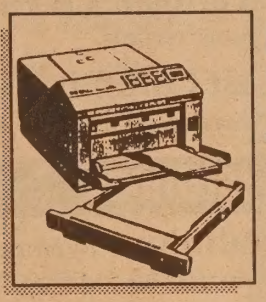

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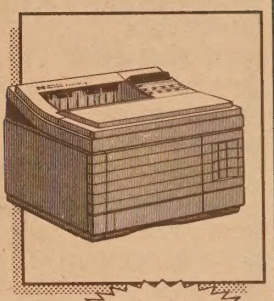

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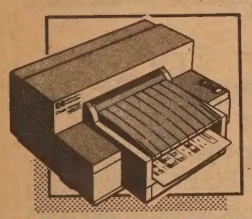

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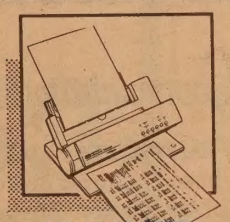

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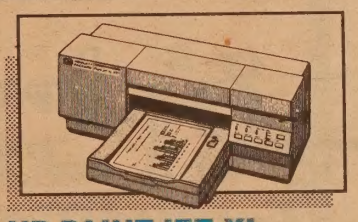

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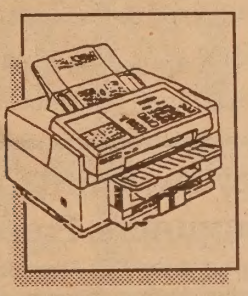

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MICROTIMES

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A NOTE FROM THE EDITORS

The huge portable computing market has taken some interesting turns lately as enterprising developers try to reach users whose needs aren't being met by current notebook-computer technology.

High on the list are corporate employees, from engineers to outbound sales forces, who remain somewhat technophobic and have some fundamentally different requirements from their desk-bound counterparts.

While many startups have sprung up recently to exploit the possibilities of pen-based interfaces and wireless communications in these markets, Mountain View-based EO is one of the first to come out with an actual product. Currently in beta test at several Fortune 500 companies, and due for volume shipment in Q2 of this year, EO's Personal Communicators offer unprecedented capabilities and ease of use.

Will EO and its Communicators succeed? It is, of course, too soon to tell. But in our cover story, president Alain Rossman, whose track record includes the Macintosh, Radius, and C-Cube, is realistic about the difficulties and upbeat about the promise of the new market.

—*ME*

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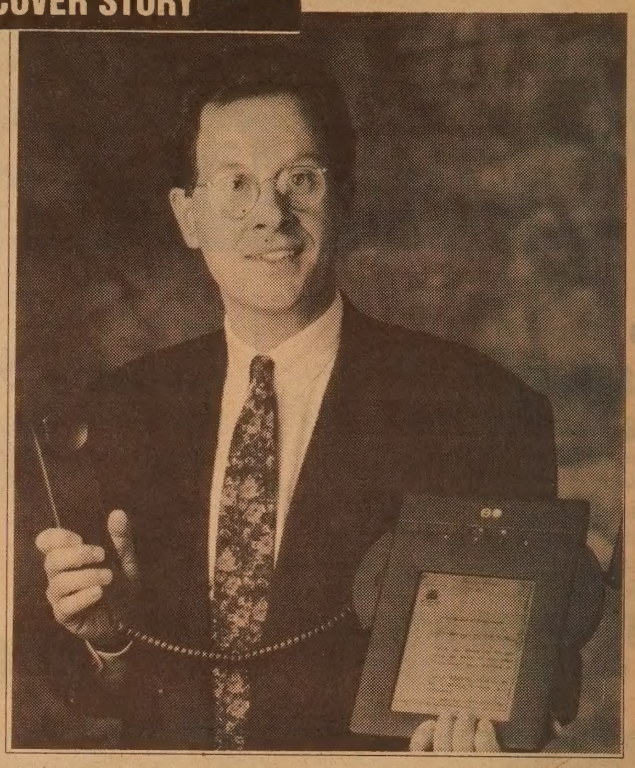

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By Mary Eisenhart • Photos courtesy of EO
Wireless, pen-based communicators? EO president Alain Rossman, one of Apple's first software evangelists, discusses the joys and pitfalls of leading-edge startups with revolutionary technology.

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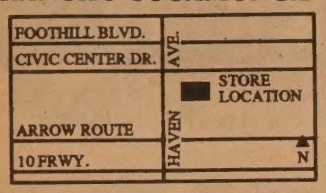

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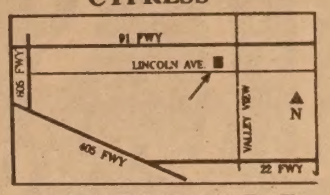

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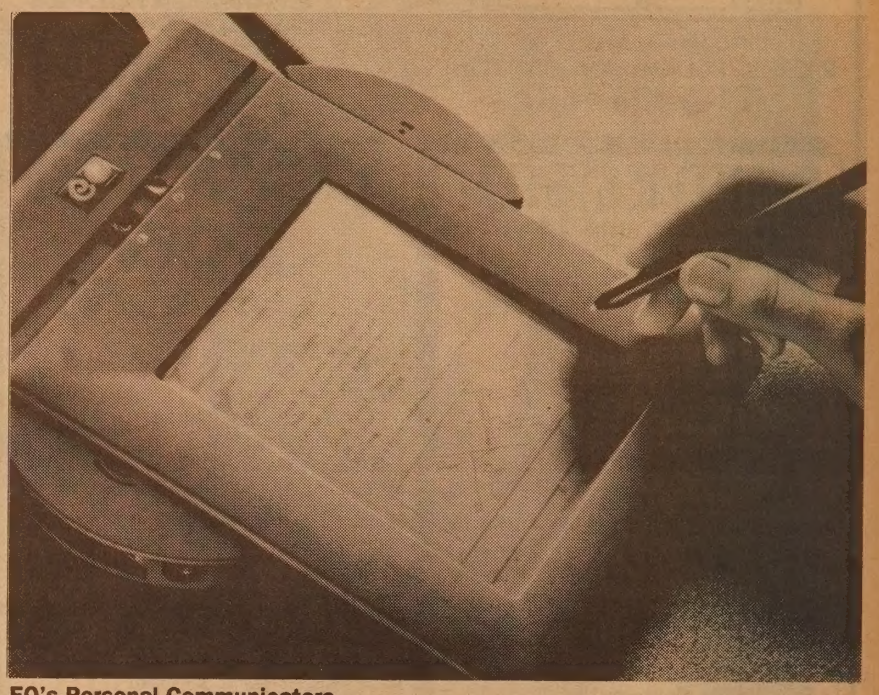

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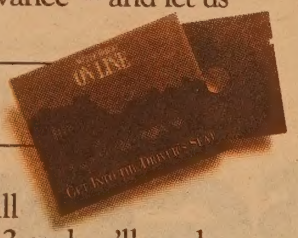

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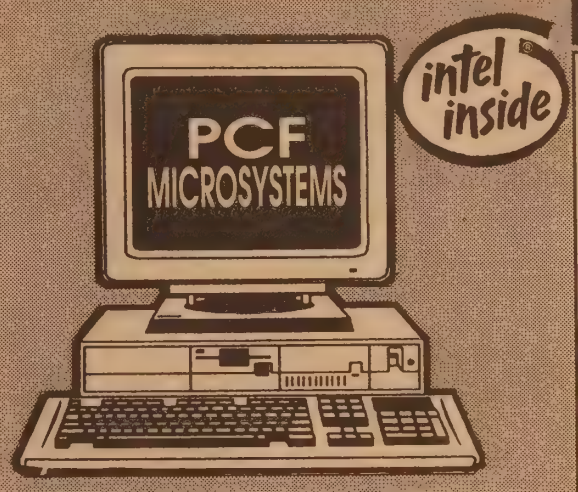

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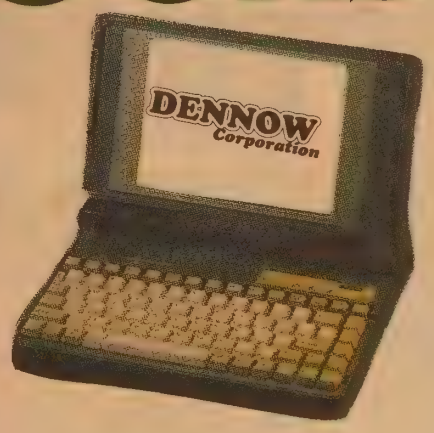

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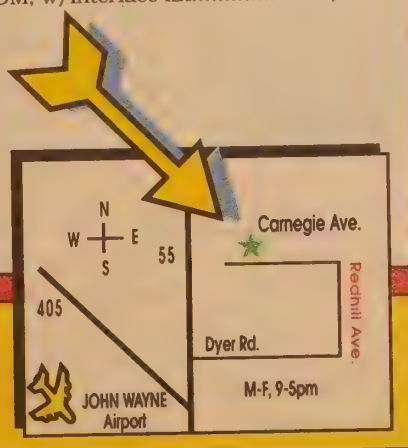

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INDUSTRY INSIGHT

UNIX News, Apple Announcements

BY PAUL HOFFMAN

NOVELL BUYS UNIX FROM AT&T

AT&T is getting out of the operating system business by selling its UNIX System Laboratories (USL) to Novell, the largest manufacturer of PC networks. With the acquisition, Novell now controls the destiny of the third major PC operating system and could give Microsoft some real competition for workstation PCs in the future.

No one at Microsoft is quaking in their boots, of course, because UNIX is still a tiny part of the PC operating system market. However, Novell could price UNIX for the PC low enough to significantly hurt Windows NT before it is even released.

UNIX is still a tiny part of the PC operating system market. However, Novell could price UNIX for the PC low enough to significantly hurt Windows NT before it is even released.

By buying USL, Novell gets many things. Most importantly, it gets the rights to sell a "real" operating system, much more robust than Novell's DR DOS. This is very important, since Novell's major product, NetWare, can easily be confused with an operating system, and Novell often must work hard to match NetWare with other operating systems. Novell also gets to control UNIX's future, which could be very important for PC users if UNIX gains parity with Microsoft's Windows NT, or even with IBM's OS/2. Novell also gets an incredible research arm from AT&T, one which would be almost impossible to assemble on its own.

Buying UNIX could really help Novell, given that its most important customers, big business, already have major investments in UNIX systems, particularly as network servers. Novell says that the acquisition is meant to help people who are converting from mainframe operating systems to more local solutions. Since the same companies often have NetWare networks that they need to interconnect to UNIX networks, Novell could make the customer's lives much easier, while still selling lots of software. Business UNIX users have generally applauded the announcement.

On the other hand, many UNIX users worry that Novell will lose sight of UNIX's goals by overemphasizing its networking options. UNIX was first and foremost an open system, meaning that (for a hefty price) it was easy to adapt to different hardware due to the way that AT&T distributed the source code. Under Novell's control, UNIX could become more proprietary, at least its networking parts. Still, it would be foolish of Novell to spend $350 million on an operating system, then turn around and anger its loyal installed base. Current UNIX users also worry that Novell will overemphasize smaller computers (such as PCs) at the expense of UNIX's traditional base of mid-sized computers.

The timing of the announcement is superb. Microsoft is terribly late with Windows NT, and developers say that the networking portions of the prerelease versions are not very stable. Large companies that are testing Windows NT are not very happy with it, although many had resigned themselves to having to use it on their high-end PCs. Now, many will wait another year to see what comes out of Novell's USL, in hopes of avoiding the need to scrap UNIX. If Novell makes a quick, big splash with a UNIX that has better networking and few bugs, they may keep Microsoft from encroaching on UNIX's territory. That would leave Windows NT as mostly an upgrade from Windows, and that market is much smaller than what Microsoft needs to make Windows NT "the platform of the future."

The deal cost Novell about $350 million, or

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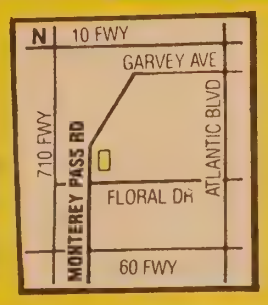

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four times USL's annual revenues. That's considered to be reasonable by industry standards, even for companies that are in only nominally related fields. In Novell's case, because USL is so close to Novell's current market, that could be considered a very good deal, especially if Novell decides to expand low-end UNIX sales beyond USL's current market. Because Novell owns DR DOS, any future Intel-based UNIX can be expected to have almost flawless MS-DOS compatibility and integration.

Assuming that the deal is approved by all shareholders (as it is expected to be), PC users can expect to find UNIX as the hub for more and more network servers. Even for a small network, the choice between the industry standard NetWare and some flavor of Novell's UNIX will be attractive, and will deny Microsoft another sale of Windows NT.

Many feel that this move will hurt OS/2 more than Windows NT because of OS/2's weak networking features. For PC power users who need a multitasking operating system that is well-tied to a network, Novell can make a much stronger case for UNIX than AT&T ever did. On the low end, Windows for Workgroups will probably be quite safe, but the merger certainly should give software developers and Microsoft something to think about.

APPLE ANNOUNCEMENTS PRESAGE PRINTER PRICE DROP

Most people think of Apple as a computer manufacturer, but peripherals have always been a major business for them. When Macintosh sales slowed in the mid-1980s, Apple was the first to hype "desktop publishing" with its new LaserWriter printer.

With its recent announcements of new printers at well below current market prices, Apple is again stepping up its campaign to be more than just a computer vendor. The new flexible printers will certainly force other major printer manufacturers to drop their prices, particularly in the PC market.

The $2100 LaserWriter Pro 600 and the $2500 630 will make fast 600 dots-per-inch printing much less expensive for the average user. Six hundred dpi printers print at four times the quality of standard 300dpi printers, and the resulting higher density is particularly important for graphics. Currently, the only other inexpensive 600dpi printer on the market is the new Hewlett-Packard LaserJet 4, and few dealers have it in stock.

Like the LaserJet 4, the LaserWriter 600 prints at 8 pages per minute and uses a new fine-grain toner. The list price of $2100 is $100 below HP's, but they both will probably end up costing about $1800 retail, and the 600 has many more features. Note that the 600 comes with 4MB of RAM and the 630 with 8MB of RAM, compared to the 2MB for the LaserJet 4.

One huge benefit that the LaserWriter Pro 600 offers over the LaserJet 4 is the built-in capability to link to both Macs and PCs at the same time. The printer comes with a LocalTalk port for connections to Mac networks, a parallel port, and a serial port. A higher-cost version of the 600, the 630, also comes with a built-in EtherTalk port for high-speed networks. Switching between the ports is automatic, so that companies that have Macs and PCs (or networked and non-networked PCs) can use a single printer. In addition, support for both TrueType and Adobe Level 1 fonts is built into the printers, as well as Adobe PostScript Level 2 software and PCL 4+ page description languages.

Apple is not just in this for printer sales. The 600 and 630 also come with Macintosh system software called FinePrint and PhotoGrade to improve the output beyond what PC users will see. FinePrint smooths the edges on text and graphics to make them appear to have more detail. PhotoGrade gives the laser printer near-photographic quality by adapting grayscale images to ninety levels of gray (instead of the sixty used on most other printers). People producing reports and documents with photographic grayscale images will probably find that the output of the 600 is close to that of an expensive 1200 dpi printer, yet costs about 6¢ a page on glossy stock instead of $5 a page at graphics output shops. FinePrint and PhotoGrade are currently only available for the Macintosh, but the printers come with standard software drivers for Microsoft Windows.

Even with these advantages, the new LaserWriters have many of the same faults as the older models. The biggest difference between the 600/630 and the LaserJet 4 is that the Apple models have no text error messages on the printer. Instead, you get four lights that blink or stay lit in case of errors. Beginning users (and, in fact, most other users) can rarely figure out what these blinking lights mean, particularly when they are first installing the printer. The LaserJet 4 and other competing printers tell you in relatively plain English what is wrong. Although this may seem like a minor problem, it is one that has frustrated Apple printer users since the first LaserWriters came out.

In addition, Apple's standard printer software continues to give cryptic messages (or no messages) when the inevitable problems occur, further frustrating beginning users.

At the same time, Apple announced its first color printer, a 360dpi ink cartridge printer costing $2350, and a new 24-bit color scanner costing $1350. The scanner should have a significant impact in the scanner market because it brings much higher resolution (1200 dpi) with color at a street price of $1000. The scanner, called the Color OneScanner, comes bundled with the new version of Ofoto scanning software and Apple's new ColorSync color standardization software. Many other software and hardware companies immediately pledged support for ColorSync, and it is clear that the standard will take hold quickly. ColorSync assures that an image that is scanned or created with a paint program will have the same colors when it is printed.

Although many people find printers mundane, they are very important to most users. Deciding how much to spend on specific printer features is never easy, and major price drops often compel users to buy better, faster printers. Apple will clearly have a strong advantage over smaller printer manufacturers in the short term with its LaserWriter 600 and 630 printers, although Hewlett-Packard will continue to have strong customer loyalty. If Apple improves the now-antiquated user interface on its printers, it could even make inroads into HP's traditional client base.

PRESIDENT OF SCO RESIGNS AFTER HARASSMENT LAWSUITS

Larry Michels, president and major shareholder in the Santa Cruz Operation (SCO), resigned last month amid accusations that he sexually harassed many women working for the company and fired those who would not give in. Weeks earlier, he had been sued by three administrative assistants who accused him of grabbing their breasts and buttocks, forcing them to kiss him on the lips, and making lewd sexual suggestions. In the days following the lawsuit, it became public that other women had sued, and one had settled privately. Later, a fourth woman joined the suit, claiming that she was fired after she resisted Michels' advances.

Michels denied that his behavior was harassment, and he and SCO have pledged to fight the suits. He said that he resigned "to place the interests of the company and its employees ahead of my own."

SCO insists that it will defend itself against the lawsuits. If it loses any of the suits, it could be very difficult for it to get future contracts with major companies, since almost every company has strong anti-harassment rules. Even if the suits are settled out of court, the exposure of the problem will significantly hinder SCO's chances in a public offering, due to shareholder's worries about future suits as well as the working atmosphere at the company. ■

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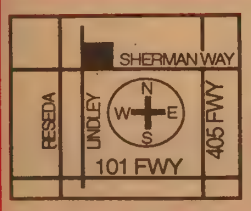

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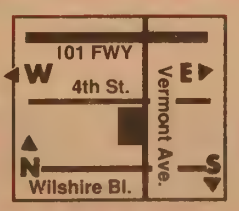

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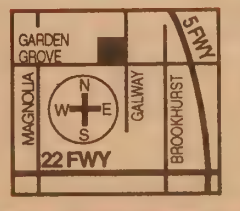

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Computer Stocks Enter 1993 In Bullish Fashion

Computer stocks continued their bull run into the new year, pushing the Microtimes Stock Index to its record high of 4020.09.

The box score for our industrial indicator during the past month: up 194.27 points, or 5.08%, with advancing issues outpacing declining issues by nearly a 3-to-1 margin.

In contrast, stocks nationally, with the exception of the NASDAQ Composite Index which hit another high of 682.40, ended the month-long trading session on a sour note after a brief bout of profit-taking trimmed December's gains.

Among the computer stocks in the news last month:

•IBM, which ruined many money manager's portfolios in 1992, fell another $14 a share, off 22.67% last month to $47.75, slightly above its 52-week low of $46.63. IBM has cascaded 50% from its 52-week high in July. Among the company's bad news in 1992: it will terminate 25,000 jobs, take a $6-billion charge against fourth-quarter earnings, and possibly cut its dividend which yielded 9.6% at year-end. IBM was the largest dollar and percentage-loser of the lot last month.

•AT&T, on the other hand, was short-circuited by shareholders last month, as it was swept $3 a share higher to a new 52-week high of $51.50. County NatWest cut its rating on AT&T to "accumulate" from "buy" based on the company's high stock price. Separately, the company agreed last month to buy 20% of Canada's Unitel Communications for C$150 million in a bid to counter MCI's presence in that country. For the year, AT&T was up 30.7%.

•Novell rallied 75 cents a share, or 2.4%, to conclude matters at $31.50. Novell and AT&T announced plans last week to jointly develop and market a product to link computer networks with business telephone systems. Novell recently agreed to buy AT&T's Unix Systems Laboratories.

•Intel soared above the $100-a-share mark for the first time ever before reaching a close of $102.38 at the period's end. Intel, which traded as high as $103 a share during the month, has surged lately thanks to strong demand for its products and signs of strength in the U.S. semiconductor market. For the month, Intel sprinted ahead $21.88 a share, or 27.17%, taking largest dollar-gained honors of all the stocks in the accompanying table. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 12/10/92	CLOSING PRICE 01/11/93	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	32.00	34.00	2.00	6.25	16	0.32	0.94	65.75	25.25
OTC	Aldus		ALDC	14.25	14.50	0.25	1.75	24	0.00	0.00	36.50	10.25
OTC	Autodesk		ACAD	46.75	49.75	3.00	6.42	29	0.48	0.96	56.50	23.25
OTC	Borland	(L)	BORL	20.75	20.25	–0.50	–2.41	–	0.00	0.00	82.75	19.75
OTC	Informix	(H)	IFMX	33.50	34.75	1.25	3.73	26	0.00	0.00	37.75	8.81
OTC	Lotus		LOTS	20.50	19.75	–0.75	–3.66	12	0.00	0.00	38.75	14.75
OTC	Microsoft		MSFT	89.00	89.13	0.13	0.14	34	0.00	0.00	95.00	65.50
OTC	Novell		NOVL	30.75	31.50	0.75	2.44	38	0.00	0.00	33.50	22.50
OTC	Oracle	(H)	ORCL	22.88	29.50	6.63	28.96	48	0.00	0.00	30.75	12.00
OTC	Software Publishing		SPCO	9.00	9.25	0.25	2.78	–	0.00	0.00	26.25	6.75
OTC	Symantec		SYMC	14.00	13.00	–1.00	–7.14	48	0.00	0.00	51.00	5.88
	HARDWARE											
OTC	Apple		AAPL	57.25	64.13	6.88	12.01	15	0.48	0.75	70.00	41.50
OTC	AST Research		ASTA	19.63	22.25	2.63	13.38	12	0.00	0.00	24.50	11.25
NYS	Commodore	(L)	CBU	7.88	6.38	–1.50	–19.05	91	0.00	0.00	19.25	6.25
NYS	Compaq	(H)	CPQ	43.00	50.50	7.50	17.44	22	0.00	0.00	50.50	22.25
NYS	Digital Equipment	(L)	DEC	33.50	35.25	1.75	5.22	–	0.00	0.00	65.50	30.38
OTC	Dell	(H)	DELL	41.00	46.38	5.38	13.11	21	0.00	0.00	48.50	15.00
NYS	Hewlett-Packard		HWP	66.63	72.75	6.13	9.19	21	0.80	1.10	85.00	50.25
NYS	IBM	(L)	IBM	61.75	47.75	–14.00	–22.67	–	4.84	10.14	100.38	46.63
NYS	Silicon Graphics		SGI	26.50	28.88	2.38	8.96	–	0.00	0.00	29.75	14.13
OTC	Sun Microsystems	(H)	SUNW	33.25	37.38	4.13	12.41	25	0.00	0.00	37.75	22.50
NYS	Xerox	(H)	XRX	77.88	83.88	6.00	7.70	20	3.00	3.58	85.75	66.75
NYS	Tandy	(H)	TAN	29.88	29.38	–0.50	–1.67	14	0.60	2.04	31.75	22.25
	CPU'S											
NYS	Advanced Micro Devices		AMD	16.88	19.88	3.00	17.78	7	0.00	0.00	21.50	7.38
OTC	Intel	(H)	INTC	80.50	102.38	21.88	27.17	26	0.40	0.39	103.00	46.50
NYS	LSI Logic	(H)	LSI	10.88	10.88	0.00	0.00	–	0.00	0.00	11.38	4.88
NYS	Motorola	(H)	MOT	103.00	112.75	9.75	9.47	28	0.88	0.78	112.75	68.50
	COMMUNICATIONS											
NYS	AT&T	(H)	T	48.50	51.50	3.00	6.19	20	1.32	2.56	51.50	36.63
NYS	BellSouth Corp.		BLS	50.13	52.13	2.00	3.99	15	2.76	5.29	55.50	43.38
OTC	MCI	(H)	MCIC	37.88	41.25	3.38	8.91	19	0.10	0.24	41.25	29.50
NYS	Northern Telecom		NT	42.13	40.88	–1.25	–2.97	21	0.36	0.88	49.25	30.50
NYS	Pacific Telesis	(H)	PAC	44.88	43.38	–1.50	–3.34	17	2.16	4.98	47.00	36.88

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER
(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	23
DECLINES	8
UNCHANGED	1
NEW HIGHS	13
NEW LOWS	4

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Intel	$ 21.88
LARGEST DOLLAR LOSER	IBM	$ –14.00
LARGEST PERCENTAGE GAINER	Oracle	28.96 %
LARGEST PERCENTAGE LOSER	IBM	–22.67 %

	CLOSE 12/10/92	CLOSE 01/11/93	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH
MICROTIMES STOCK INDEX	3825.83	4020.09	194.27	5.08
DOW JONES INDUSTRIAL AVERAGE	3312.19	3262.75	–49.44	–1.49
STANDARD & POOR'S 500 STOCK INDE	434.64	430.95	–3.69	–0.85
N.Y.S.E. COMPOSITE	238.97	237.09	–1.88	–0.79
NASDAQ COMPOSITE	658.93	682.40	23.47	3.56

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
06/05/92	3562.74	3398.69
07/02/92	3182.43	3330.29
07/31/92	3367.19	3393.78
08/28/92	3198.48	3267.61
09/25/92	3313.28	3250.32
10/23/92	3536.03	3207.64
12/10/92	3825.83	3312.19
01/11/93	4020.09	3262.75

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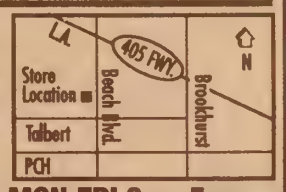

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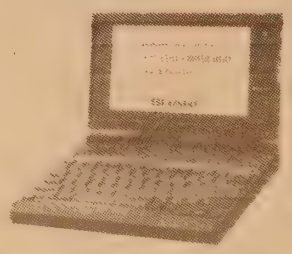

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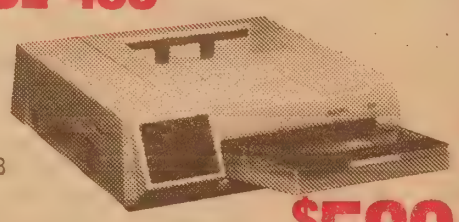

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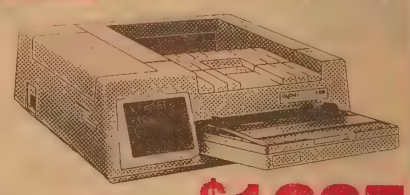

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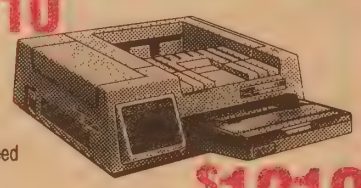

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Public Access To Public Records–Part I

Implications Of The California Public Records Act

BY JIM WARREN

These columns concern the realistic near future.

This one concerns citizen access to an invaluable taxpayer asset—information held by local, state, and federal governments, increasingly computerized at massive public expense.

Experts estimate that by mid-decade—only two years away—at least half of all office records and files will be originated (created), annotated (modified or updated), stored (filed), indexed and cross-

REALIZABLE FANTASIES

indexed (linked, classified, related), retrieved (accessed), and exchanged (transmitted) by computer. This is even more true of government records. Furthermore, *moderate* estimates predict that the percentage of such records that are computerized will rise to 80% or more by the decade's end.

Computerized public records pose significant opportunities—and threats—for the people's ability to monitor the people's business.

PUBLIC RECORDS REFORM

For three reasons, this discussion focuses on the California Public Records Act (CPRA): 1. The CPRA is reputed to be one of the better state FOI statutes—even though it has huge imperfections; 2. Legislation in California, New York, and a few other states often impacts federal legislation; 3. There is currently a broad-based effort underway to improve the CPRA. The Reform Coalition (CPRARC) is spearheaded by the California Newspaper Publishers Association and the California First Amendment Coalition, but includes *numerous* other public-interest and watchdog groups.

Note however: All the following issues are equally applicable to local, state, or national freedom-of-information (FOI) provisions in *any* democratic society. (Section references ["§"] hereafter are to the California Government Code.)

The principle: The CPRA opening sentence states, "Access to information concerning the conduct of the people's business is a fundamental and necessary right of every person." [§6250]

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DEFINING A MODERN "PUBLIC RECORD"

The decades-old CPRA defines a "public record" as including "any writing containing information relating to the conduct of the public's business prepared, owned, used, or retained by any state or local agency regardless of physical form or characteristics." [§6252(d)]

Next, it says that "writing" means, "handwriting, typewriting, printing, photostating, photographing, and every other means of recording upon any form of communication or representation, including letters, words, pictures, sounds, or symbols, or combination thereof, and all papers, maps, magnetic or paper tapes, photographic films and prints, magnetic or punched cards, discs, drums and other documents." [full text of §6252(e)]

Better still, the state Attorney General opined that a public record is "a thing which constitutes an objective lasting indication of a writing, event or other *information*, which is in the custody of a public officer and is kept either (1) because a law requires it to be kept or (2) because it is necessary or convenient to the discharge of the public officer's duties and was retained for the purpose of preserving its *informational* content for future use." [Emphasis added; 64 Ops Cal Atty Gen 317, 326 (1981); reference kindly provided by Alameda County Assistant D.A. Don Ingraham.]

The statutory definition seems to focus on physical form. The AG's opinion—more accurately—focuses on a public record as *information*. The statutory definitions need to emphasize that concept, especially as ever more government information becomes less related to its physical form when computerized.

(Note: As a starting point, I submitted possible legislative language to the reform coalition's drafting committee addressing the above and following issues.)

"PUBLIC RECORD" BECOMING ILL-DEFINED

In the old days, "records" were paper instruments—listings, memos, letters, arrest records, complaint forms, reports, budgets, photographs, etc. Later, they included sound recordings, motion pictures, videotapes, etc.

Increasingly, however, records are created, modified, cross-referenced, and stored in digital form—sometimes *only* in digital form. Examples include interdepartmental electronic mail, budget spreadsheets, community and census data in geographic information systems (GIS), etc.

But here's the real ringer: As government data is computerized in relational databases, its component parts are becoming indexed, cross-indexed, inter-related, and commingled in a manner that leaves it unclear where a "record" begins and ends.

Hypothetical(?) example: Assessors' real estate records include assessed value, name and address of owners, etc. Assessed value is related to sales of comparable parcels, stored in Recorders' title-

In The Flesh

Jim Warren often speaks and lectures about technology, government, freedom and privacy, and also about personal computing's history and future. On January 27, he is the speaker for Santa Clara County's Bench-Bar-Media-Police meeting. February 10, he is the speaker for the Independent Computer Consultants' Association Northern California meeting at the SFO Airport Hilton. February 14, he is the morning keynoter for the Libertarian Party state convention at the Sunnyvale Hilton. March 10, he will chair the Electronic Democracy session in the Third Conference on Computers, Freedom & Privacy at the SFO Airport Marriott.

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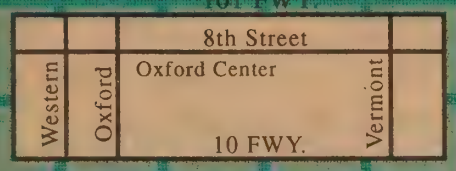

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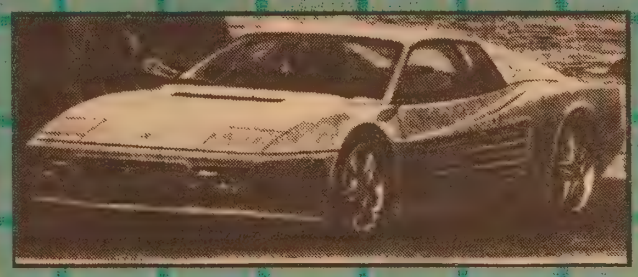

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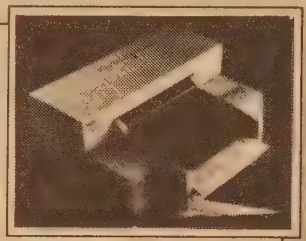

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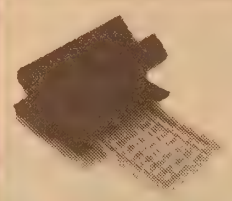

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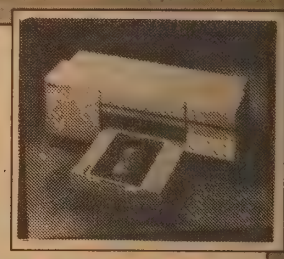

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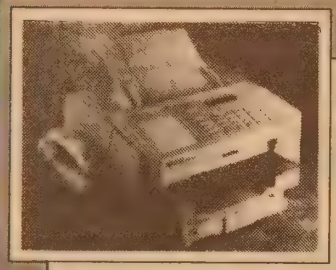

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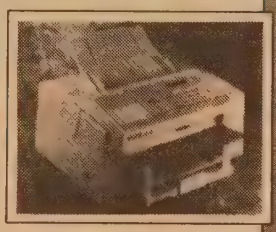

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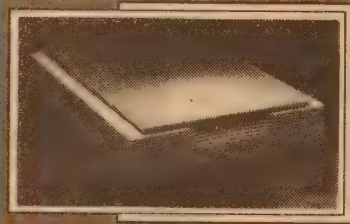

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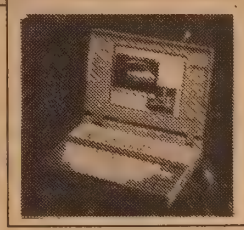

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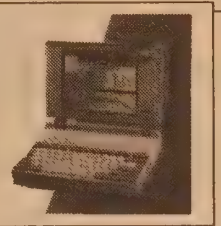

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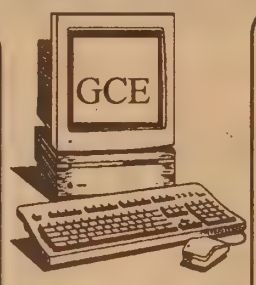

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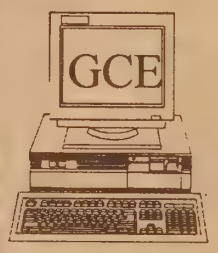

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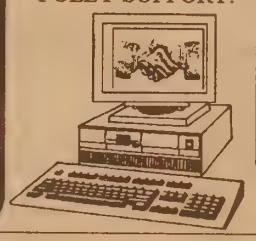

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transfer records. Owners may be related to all parcels they own for unified billing, or because multiple assessor parcels sometimes compose a single "legal" parcel for planning and building purposes. These records, in turn, are related to Planning Department records, zoning records, building inspection records, Health Department records, code-violators' citations, owners' other tax records, etc. Some of this cross-indexing has existed for decades, but only in paper annotations. Now, much of it is computerized, and there's much more of it.

Some of the most valuable public—and private—information is in *the relationships or cross-references between information in government records.*

The cross-references themselves, between public components of public records, should be clearly identified as public information that can be examined and used by citizen researchers. And the concept of "a [public] record" needs to be reviewed in the context of relational database systems.

COPYING A PUBLIC RECORD—OR DATABASE

One can examine a public record, or obtain a copy of it. For instance, the CPRA states, "Any person may receive a copy of any identifiable public record or copy thereof. Upon request, an exact copy shall be provided unless impracticable to do so. Computer data shall be provided in a form determined by the agency." [Cal. Govt. Code §6256]

First of all, computerized information is often *most* useful in computerized form. Agencies should offer computer-readable copies of computerized public records.

Computerized records make it trivially convenient and inexpensive to copy the equivalent of an entire file drawer—or file room—often in minutes; often on media that cost less than a carton of copier paper.

On the other hand, citizens often ask an agency to search or process public records in ways the agency would not normally do. Agencies often have neither staff, expertise, nor equipment to fulfill such customized requests. To resolve this, machine-readable copies of entire files of public records should be equally as available as copies of their individual records—but only in the formats and on the media the agency already uses to make such copies (e.g., for backup).

When agencies have commingled public data with private or confidential data, they must assure their ability to disclose the public data while protecting the private or confidential data.

MORE TO COME; PASS IT ALONG

We will continue reviewing the impacts of computerizing public records—including fair copying costs, privacy considerations, covert cross-references, proprietary software and systems, high-profit monopoly of public records, access for the computer-handicapped, etc.

Pass this along—to your community group, watchdog organization, local public administrator, local or state elected representative, etc. Also pass it along to your local newspaper editor; they should be aware of how computers are impacting *their* access to government records.

AND ONE QUICKIE

In *Hacker Crackdown,* Bruce Sterling devoted eight pages to describing what he called a "truly mind-boggling event"—the First Conference on Computers, Freedom & Privacy (1991). Another mind-bender, the Third CFP, will be held on the San Francisco Peninsula, this March 9–12. Anyone can register, but space is limited. "For a good time, call" Bruce Koball, CFP'93 Chair, 2210 6th St., Berkeley, CA 94710; (510)845-1350, fax (510)845-3946, email cfp93@well.sf.ca.us.■

Jim Warren founded InfoWorld, *Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various trade and professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics & statistics. He has been a computer professional since 1968, and was a mathematics teacher and professor for ten years before that.*

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991), sponsored by a dozen nonprofit civic, professional, and industry organizations, and received one of the first Electronic Frontier Foundation Pioneer Awards (1992). He is a member of the board of directors of Autodesk, Inc., and also chairs the Communications Committee of the California Public Records Act Reform Coalition.

14.4 Send/Receive Fax Modem

V.32, V.32bis, V.42, V.42bis

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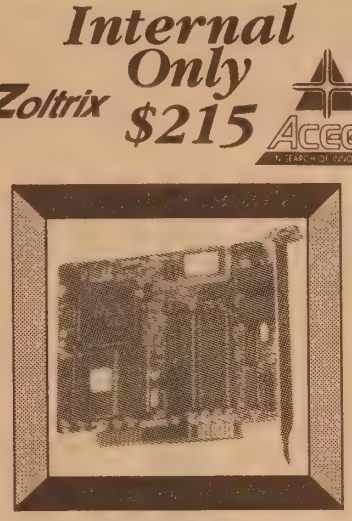

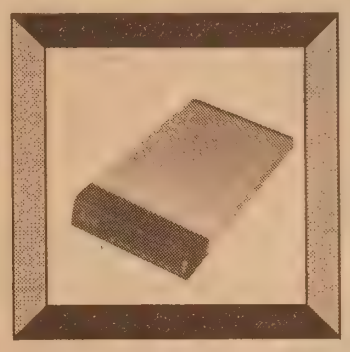

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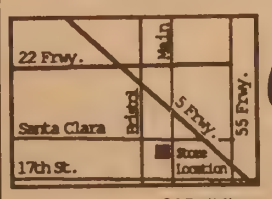

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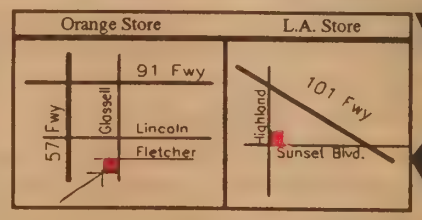

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The Newest Wizard

Sharp's OZ-9600 Includes Touchscreen, Pen Input

BY MITSU HADEISHI

One of the hottest palmtop organizers on the market is the Sharp Wizard series, which covers a large product line ranging from machines like the $130-list ZQ-2400 on up. I myself own an OZ-8000 series Wizard, which I find to be extremely useful and well designed, so I was quite interested to hear about the new OZ-9600, which includes a number of feature enhancements including a graphical user interface and pen input.

The OZ-9600 lists for $649, comes with 256K of RAM, one card slot, a touch-screen panel with a resolution of 320 x 240 dots, a new infrared communications port, all of the standard Wizard organizer functions including memo pad, scheduler, outline processor, phone book, calculator, terminal, world clock, as well as some new functions. The unit measures 7 1/8" x 4 1/8" x 1", which makes it roughly the same width and depth as the OZ-8000 series, with the addition of around half an inch in height. The most interesting addition is support for pen input, which works with a pen-like plastic stylus, which is supplied with the machine and stores neatly in a clip above the keyboard when the machine is closed.

This is the largest Sharp Wizard ever built, which makes it a bit less portable than its predecessors, but still small enough to fit in a jacket pocket. The extra size, however, allows the keyboard to be quite large, and it is just spacious enough to allow touch-typing. The display acts as a kind of extra keyboard; the function keys in earlier Wizards have now been replaced by an area of the touch screen which has the functions printed permanently beneath it. In addition, other buttons and functions on the display can now be accessed using the touch screen. The card slot is no longer visible; any card plugged into the slot will have its buttons displayed on the touch screen rather than through a transparent panel, as was the case with previous Wizards. This gives the OZ-9600 much more screen space without sacrificing card functionality.

The stylus provided is simply a piece of solid black plastic; it is not a special electronic device (you can, in fact, use your finger to "push buttons" on the touch screen).

There are a number of problems with the pen interface, however, which can be confusing to someone just starting out with the machine. In particular, the interface is highly "modal," which means you have to make sure you're in the right "mode" before your input will be recognized. Modern user interfaces (such as that offered on the Psion 3, or on desktop machines like the Windows or Mac interfaces) tend to be non-modal—you are usually allowed to use any option whenever it makes sense for you to do so. Because of the "modal" nature of the OZ-9600's interface, you can often get stuck in situations where the unit will not let you do what you want to do until you figure out how to get out of the mode you're in; this can be frustrating and is an unfortunate design flaw which Sharp would do well to address in future versions.

The pen-input capabilities of the OZ-9600 are limited; it does not do handwriting recognition; you use the pen either for selecting options or for jotting down handwritten notes or making drawings (sketches, maps, doodles, and the like). If you jot down a note into the OZ-9600 using the pen, it does not convert it automatically into text, the way the Newton will; it simply stores it as graphics, which takes more memory. Also, you can only draw into one application: the "scrapbook." This is by no means a "pencentric" device; the pen is really used as an adjunct to the keyboard, and cannot be used as a replacement for it (in the case of the Newton you often have no keyboard whatsoever, just a stylus). However, this added capability does add to the flexibility and usefulness of the machine.

Unfortunately, there are a number of drawbacks to the 9600 which vary in importance depending on your particular application. For me, the worst problem is that the processor is too slow to keep up with fast typing. This is ironic, since the keyboard is finally large enough to enable you to type at a rapid clip, but the machine can't keep up; it will lose characters if you type too fast. Thus the machine is really not too useful as a note-taking device (for me, at least), which is what I often use my OZ-8000 series for. However, many people don't type all that quickly, and though the keyboard is large for a palmtop, it is still smaller than a standard keyboard; you may not be able to out-type the machine even if you can touch-type on a full-sized keyboard.

Another problem is the screen is somewhat dim compared to the other Wizards; this is probably due to its large size, and the need to conserve power; it may also be due to cost considerations. Also, there are the user-interface problems noted above, which are annoyances rather than major problems; however, they can reduce the functionality of the unit. After all, when you're on the road, you want to be able to quickly look something up or type something in; having to deal with user-interface problems while you're trying to jot down a note or recall some information quickly can be a problem, at least until you learn your way around the machine's idiosyncrasies.

As for functionality, this machine has everything that previous Wizards had and more: The calendar-scheduler in which you can put appointments and other events and view them by month, week, day, or by individual appointment works much like previous Wizards, though with added graphical user interface functionality. The To Do list and the Anniversary function operate much like versions on previous Wizards, though with a nicer-looking user interface. The Calculator is implemented very conveniently as a pop-up application; when you're done with it, you can go back to what you were doing before. The clock and world-time function pop up in a similar fashion. The memo pad (now called "Notebook") and outline processor are implemented much as they were in previous Wizards, except that you now must title each memo entry. (This can be a bit of a bother, since you have to remember to hit the down-arrow key after entering the title, not the enter key, as was the case with previous Wizards. The same goes for all other titled entries. If you hit the enter key, it will store your

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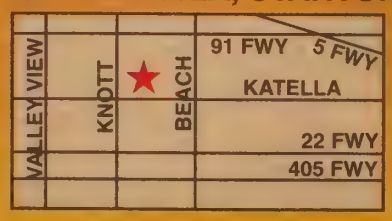

memo with no text.)

A new function, called the scrapbook, allows you to enter drawings and graphics. However, there is unfortunately no way to mix text and graphics in, say, a notebook entry; you either have all graphics (stored in the scrapbook) or all text (stored in the notebook). You can group text with graphics in a "folder," though this is not as convenient as it would be to mix text and graphics in one entry. You can also paste text into a scrapbook page (but it is stored as graphics, not text). If you try to paste a picture into a text notebook page, you get the text "<PICTURE>", not the actual drawing. It's not exactly the Mac or Windows.

A handy new feature is the Filer, which allows you to group any number of individual items together in a "folder," which is a way to quickly index a number of items located in different parts of the organizer. For example, you can drop a notepad note, a scrapbook picture, an address book entry, and a scheduler entry into a single "folder," and have quick access to any of the related entries at once. This could be a useful feature for creating compound documents. Entries may be a member of more than one folder at once.

An interesting addition to the machine is an infrared interface port, much like the one on the HP 95LX. This allows you to communicate with another 9600 without any additional hardware; you can also buy other special wireless peripherals for the unit. For example, you can get a wireless interface that allows you to upload and download information to and from your PC without having to connect a cable. You can even purchase a wireless printer interface, which allows you to print directly from your organizer via the infrared port.

The user interface problems, however, can be annoying. These can be confusing at times especially to the novice user, despite, or in some cases because of, the new pen interface. This can be alleviated by practice and use of the machine, but it takes some time. For example, the function buttons on the left hand side of the screen often do not work if you're not in the correct "mode." In the scrapbook, for example, you might be in the middle of drawing something, then decide you want to look at the notebook; if you try to change to another function, however, nothing happens. You have to first store or cancel the drawing before the OZ-9600 will let you change to the notebook. The scrapbook seems to have the most problems switching to another application, perhaps because it is the newest function in the 9600.

Other user-interface problems: It is difficult to quickly search for an item by substring. On the OZ-8000 series, you can quickly find any item in a particular function that contained a substring by just selecting the function, typing the string, and hitting "shift-search"; to do the same thing on the OZ-9600, you have to bring up the "search" function, backspace over the previous search string, then type in the string you want to search for. This makes it a bit more difficult to search for new items. Sharp should have eliminated these minor problems before releasing the product commercially; we hope Sharp will address these problems and update the firmware in a future version of the OZ-9600.

Overall, the OZ-9600 can be a useful machine, and if you can get used to the various glitches and problems, it has much to offer: more memory, pen input, a better keyboard, wireless connectivity. It suffers, however, from a slow processor (it should really have at least twice the processor speed), awkward user interface, and other minor hassles, as discussed above. It is, however, one of the cheapest machines currently available which has pen input of any kind, and thus is one of the first palmtops in this country to break the $1000 barrier with a pen-based technology of any kind. If you're willing to sidestep the user-interface problems and annoyances, and don't mind the inability of the unit to accept rapid keyboard input, then you might want to seriously consider this unit. However, Sharp has created an opening for the competition by releasing an uncharacteristically flawed unit, and while there are currently no competing machines that quite fill the market niche of the OZ-9600, this situation may change soon. Watch this space for updates.

OTHER PALMTOP AND PEN NEWS

Franklin Electronic Publishers, Inc., creators of the Franklin Digital Book System-1 reviewed in last month's issue, have announced an agreement with IDD Information Services to publish their Tradeline stock performance database as a digital book. The Digital Book System-1 is a very small palmtop unit whose sole purpose is to serve as a "reader" for Digital Books, ROM cards with programs and information stored on them.

Tradeline will be publishing the information as an independent publisher using Franklin's developer's kit for the DBS-1. The Tradeline pocket stock guide gives consumers the ability to access performance information on securities. The book will include financial information for over six thousand NYSE, AMEX, and NASDAQ issues, and will include graphics and charts. Updates to this information will be published on a subscription basis.

ABC Computers has announced a $1250, 2.2lb. sub-subnotebook computer called the BICOM B260i which is only slightly larger than the Sharp PC-3000 palmtop reviewed a few months ago, but has a full 60MB hard disk drive and a 640 x 400 resolution LCD screen capable of displaying Microsoft Windows graphics. The unit supports CGA and AT&T graphics mode, and includes Windows support. It is powered by five AA size batteries, though this only gives it four hours of continuous operation. More on this unit in a future column.

Slate Corporation, a pen-based software company, has begun shipping its PenApps Application Builder v1.0 for Windows for Pens. A PenPoint version should be available first quarter of 1993. PenApps is a visual development tool that allows developers to create forms-based applications. PenApps includes a forms designer, a database module, and the Slate PenBasic programming language. Applications built using PenApps are portable between Windows for Pens, PenPoint, and potentially other pen-based operating environments as they become supported. ■

RESOURCES:

BICOM B260i
ABC Computer Corporation
2531 237th St., Ste. 122
Torrance, CA 90505
(310)325-4005

Sharp Wizard OZ-9600
Sharp Corporation
Sharp Plaza
Mahwah, NJ
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1-800-321-8877

Slate PenApps
Slate Corporation
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A New Printer From An Old Friend

Smith Corona Presents A New Ink Jet Printer In Its Entry To The Printer Market

BY ED KAHN

The choices in inexpensive high-quality printers is expanding. The latest entry is, much to my surprise, a well-known name that has never before claimed a stake in the printer market. Smith Corona, the old line typewriter maker, has just introduced the Coronajet 200j printer that utilizes ink jet technology and carries a list price of under $500.

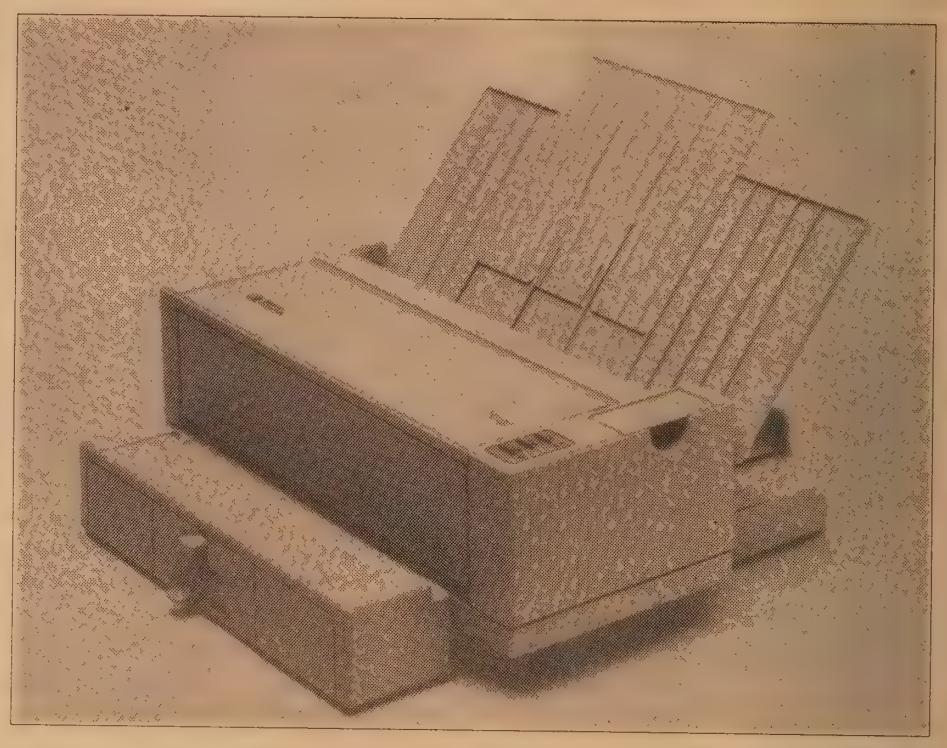
While not technically a portable printer because it offers no battery power supply, the Coronajet 200j is a formidable printer for home use or as a second printer for people working with notebook computers at an off-site location. The printer weighs a scant 6.4 lbs., has a footprint of 5.8" x 13.5", and measures 4.5" high. The basic printer handles single sheets of paper as well as envelopes, but a cut sheet feeder ($89.95) is available and holds about seventy sheets of paper.

This printer invites comparison to a Hewlett-Packard DeskJet Plus—providing DeskJet emulation and twenty resident fonts. The Coronajet is a good deal smaller than the DeskJet as well as less expensive. But the print quality is in the same class, offering resolution of 300 x 300 dots per inch. The printer produces text at eighty characters per second in letter-quality mode and offers a draft mode that turns out copy twice as fast. This translates to a page output of between one and a half and two pages a minute—a bit slower than the DeskJet.

The Coronajet 200j arrives as a shoe box shaped unit. The top folds backwards to provide a gathering rack for pages that come from the printer. Like the DeskJet, the pages will pile up in reverse order. I like the arrangement of a regular LaserJet that spews pages out in the correct order. Single sheets and envelopes can be fed through a slot in the front of the printer.

While the standard Coronajet printer gets the job done, the cut sheet feeder is worth the extra expense. This accessory turns the unit into a first-rate printer that is more than adequate for anyone who does not demand high volume output.

Smith Corona has packed this printer with features. Thirty-one switches are provided for selecting fonts, paper size, and a host of other choices that provides a great deal of flexibility. The printer will also respond to standard PCL3+ commands.



Besides paper, the only supply the Coronajet requires is the ink cartridge. This is available from Smith Corona, but you can also use a DeskJet cartridge, which means that it is readily available.

Without any documentation, I was able to have the printer working within minutes; it is designed so simply that you will do little more than plug it in, connect it to your computer's parallel port, and begin printing. When the documentation for this unit arrived a few days later, I discovered details about its operation that I would have missed otherwise. The spiral bound documentation is clearly written and extremely thorough. This is especially helpful for the novice who has not been immersed in the arcane language of printers.

Although the printer is designed to emulate the DeskJet, optional emulation cards allow you to choose the alternate emulations of either the Epson FX-850 or the IBM Proprinter ($124.95 for either). The slot that holds these cards can also be used for memory expansion cards. Both 128K and 256K sizes ($129.95 and $179.95) are available. These cards allow you to download additional typefaces. If you prefer, Smith Corona offers fifteen different font cards that fit into the slot. These range in price from $89.95 to $129.95.

Smith Corona has put a good deal of attention into the design of this printer. I noticed that the slot that holds these cards conforms to the PCMCIA standard. Nowhere in the documentation is this stated, but obviously they felt that using these specifications would add greater versatility to the machine. I tried to fit a 512K card into the unit, and it went in smoothly. Unfortunately, I did not have either of the two downloadable font card kits ($59.95 each), which come on both 3.5" and 5.25" disks.

For a long while, portable computers were light years ahead of the printers. Now, thanks in large part to advances in ink jet technology, there are a number of choices open to the printer customer who wants laser-quality without the expense or bulk of a laser unit. The Coronajet 200j is certainly a printer to consider when looking for an ink jet machine. This unit carries a 12 month warranty.

RESOURCES:
Coronajet 200j, $499.95
Smith Corona Corp.
65 Locust Ave.
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COMPUTER of the month: Dell 325NC

RESOURCES:

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Austin, TX 78759
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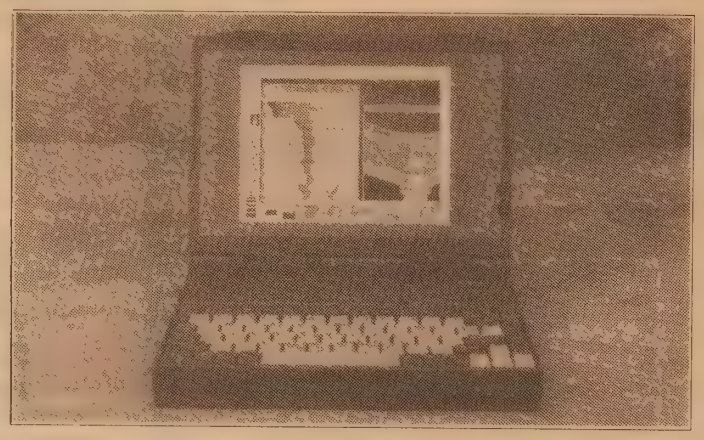

It is always a pleasure to review a new Dell computer as this company has established the highest standards for quality, workmanship, documentation and support. This new color unit is no exception.

The 325NC is a 386SL machine running at 25MHz. It comes standard with 4MB of memory, expandable to 12MB. Dell has designed this notebook so that users can easily install additional memory themselves. Simply open the compartment cover located just above the keyboard and slip in the memory modules. Full instructions are provided. Upgrade costs range from $149 for an extra 2MB all the way up to $599 for an 8MB addition.

The computer weighs a little over 7 lbs., including the batteries. Its dimensions are 8.5" x 11" x 2.3." The basic model comes with a 60MB hard drive, but larger drives are available. To upgrade to an 80MB drive, add $200. You can get drives with a wide range of capacities: 120MB (add $400), 200MB (add $600).

The screen size is 9.25" measured diagonally. This is a far cry from the first color computer I used several years ago. That technology was so primitive that I actually preferred a monochrome display. While active matrix LCDs offer superb quality, in many ways comparable to a CRT monitor, passive matrix displays still do not reach that level. Nevertheless, it is quite acceptable in this computer—the passive matrix display certainly beats even the best monochrome displays. If you want a larger screen, Dell provides a port for attaching a VGA monitor. I found this unnecessary, but if I were working with this computer all day, I might prefer to use a standalone monitor as it would offer a larger display.

The keyboards on Dell computers are well-designed, with the cursor keys in an inverted T formation. Separate keys are provided for PgUp, PgDn, Home, and End. An embedded numeric keypad is provided, but if you can't stand that arrangement, you can buy a separate numeric keypad ($149) from Dell or attach a full keyboard of your choice to the unit.

Dell has designed this computer for long operation on the rechargeable Nickel Metal Hydride battery. Even without implementing the power management options, you can expect to get three hours use from a fully charged battery. One of the features of the computer is a battery gauge that will tell you at any time what percent of the charge is still in the battery. Additional battery packs are available for $169. Dell has included a sophisticated power management system. The options allow shutdown of the serial and parallel ports, display, and the hard drive. There is a suspend button located on the top of the machine that shuts the unit down and returns you to where you left off when you hit any key. An internal battery allows you to change the Nickel Metal Hydride battery pack without powering down the whole machine.

Although there is only one serial port, Dell has thoughtfully included a mouse port as well as a compartment for adding a modem. Two models are available: a 2400/9600 baud send/receive fax modem ($299) and a 9600 baud send/receive fax modem ($599). Fax software is included.

Dell sells a wide range of hardware as well as software options. Virtually everything you might want for the computer is available: numeric co-processors, external floppy drives, battery chargers, automobile power, and tape backups are some of the available options. You name it and Dell can supply it. Dell also sells software. The advantage of buying the software from them is that they install it as well as send you the disks. So when you get your machine, it is ready to run.

One of the hardware/software options is a package including MS-DOS 5.0, Windows 3.1, and a Microsoft ballpoint mouse that attaches to the side of the computer. This package costs $200 and is highly recommended. While I prefer a standard mouse, this one is certainly convenient, especially when traveling.

A final option is a roomy carrying case ($99). A slip case comes with the Dell 325NC, but does not have compartments for all of the things you need to carry along with the computer.

Like all Dell computers, the 325NC comes with a one year warranty and a bunch of technical support phone numbers for locations around the world. With a Dell product, you get a top tier machine for a little less money.

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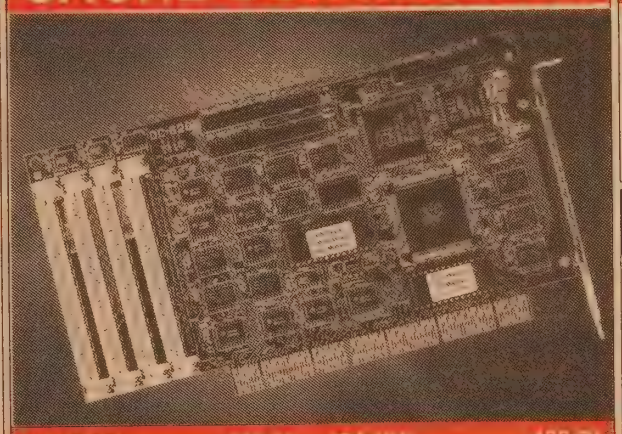

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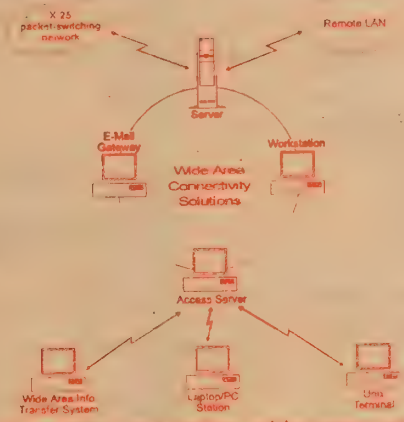

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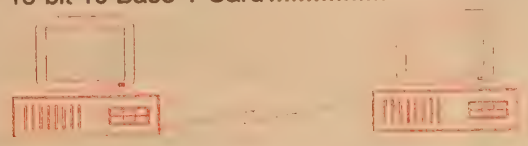

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Telecommuting Programs That Work

Telecommuting Becomes An Established Part Of The Work At PacBell

BY ROBERT MOSKOWITZ

Many articles and discussions of telecommuting treat the subject as if it were theoretical, or an activity seen only among a fringe group of privileged employees or fondly tolerated specialists. But nothing could be further from the truth. Telecommuting is no more theoretical, no more a fringe activity, than carpooling or conducting business over cellular telephones.

According to Link Resources, a New York City-based research and consulting firm that conducts the National Work-at-Home Survey every year, about 39 million people did at least some of their work at home during 1992, up from 25 million in 1988. Of these 39 million, 8.6 million do company work after normal business hours using computers, modems, faxes, or extra phone lines installed at home. In addition, nearly 24 million people are working part- or full-time at home as self-employed business owners or consultants. But the most relevant number for a discussion of telecommuting is the 6.6 million bona fide teleworkers who operate from home part- or full-time during normal business hours.

California companies can boast quite a few successful telecommuting programs that have advanced well beyond the pilot stage.

"People are telecommuting much more now than in the past," says Gil E. Gordon, a well-respected consultant on flexible work options, based in Monmouth Junction, NJ. "There are more teleworkers in 1992 than ever before, both in sheer numbers and also in the diversity of the types of jobs and types of organizations in which they work. But it's hard to hear about their successes. Much of what happens takes place in smaller organizations that do it a few people at a time, and they just don't get press coverage for their efforts toward telecommuting."

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PACBELL TELECOMMUTERS

California companies in particular, which have been quietly leading the charge toward more telecommuting, can boast quite a few successful telecommuting programs that have advanced well beyond the pilot stage to become an established part of organizational work patterns.

Pacific Bell, for example, has over one thousand telecommuters staying home from the office at least one day a week. At one time, there were about two thousand PacBell employees telecommuting regularly, but over the past few years the company has been encouraging people to take early retirement, and many of those who retired had been active telecommuters. Of those who remain on the job, few, if any, have elected to stop telecommuting.

Most of PacBell's telecommuters are staff support people working in Northern California. They live in widely dispersed communities, often a long way from their primary office assignment. Many are "project managers" for specific new product and business-development projects. Telecommuting offers them a perfect opportunity to increase productivity and eliminate one or more round trips to the office—much of their work involves reading, writing, and talking on the phone, tasks easily accomplished off-site. One task that a typical PacBell teleworker might do while working at home would be to write specific business operating procedures. For example, sales support personnel will often work at home while writing the procedures that sales people must follow to implement a new or additional telephone service for a PacBell customer.

Few of PacBell's sales people now telecommute, but they do in AT&T and other telephone companies. PacBell management,

Low-Tech Satellite Centers Work Well for PacBell

PacBell's satellite centers look nothing like a high-tech jumping off point for telecommuting workers. The centers look just like a normal office, furnished with cubicles, 1980s-style standalone desks, and such low-tech equipment as file cabinets, bookcases, and a phone. Each cubicle has a computer, and a central equipment room contains a copying machine and a fax. Each satellite center also has a PacBell Communications System (or Centrex) that provides telephone service and allows 3-way calling, voice mail, and other special capabilities.

Each of the satellite centers is hooked to the local area network for the office it is most often serving—the North Hollywood center is hooked to downtown Los Angeles, and the San Francisco center is electronically linked to San Ramon. The network supplies the teleworkers with centralized word processing capabilities, as well as access to PacBell's usual office databases.

If a telecommuter at one of the centers needs special access to a particular company database, their computer is fitted with a modem and programmed for dial-up access as required.

Continued on page 47

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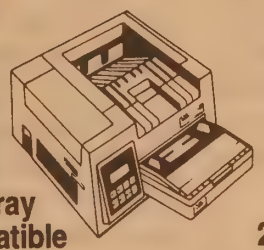

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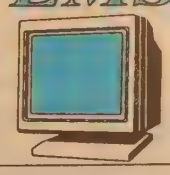

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PCMCIA Moves To The Network

Emerging Standard Offers Unique Advantages

BY YACCO

PC Cards were originally developed for handheld machines like the HP 95LX, and adopted by notebook machines like the Toshiba T3300SL. They've evolved with the guidance of standards groups such as JEIDA (Japan Electronic Industry Development Association), JEDEC (Japan Electronic Devices Engineering Council), and PCMCIA. Now these standards have consolidated, and in consolidating, created a force that is going to change the PC.

Industry pundits are predicting that by 1995 there will be some six million portables with PCMCIA slots, and that slightly over a million LAN adapters will be sold that year. However, these estimates do not take into account the number of desktop solutions that will be available for PCMCIA.

LOCAL AREA NETWORKS

This year's COMDEX was loaded with notebooks and handhelds that accept PC Cards, as well as a large showing of the cards themselves. It's the availability of cards that will stimulate more system development. I think we'll see a number of PCs with PCMCIA slots at next year's COMDEX. That will spur even more PC Card development, and within two years, PC vendors will be able to begin offering desktop systems in which the PCMCIA bus is the primary or only bus.

There are overwhelming reasons for PC vendors to do this, and they're not just the advantages that PCMCIA offers to the user.

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ADVANTAGES OF PCMCIA

The immediate advantages of PCMCIA to the user are obvious: simple installation, hot swapped repairs, and even hot swapping of functionality. It's unnecessary to open your computer to add your network adapter—merely plug in a PC Card. If a LAN interface goes bad, just pull it, and plug in another. That's hot swapping.

It works for ordinary operations too. You'll be able to plug in a modem PC Card, download a file, swap the modem for a flash-memory PC Card, and store the data before plugging in something else. (Of course, desktop machines could easily provide a score or more tiny card slots, but as long as vendors like Apple have a stranglehold on users of their proprietary systems, they will probably always use a limited bus to push users into their top-of-the-line machines. At least, PCMCIA will make it harder for them to do it.)

There are also longer-term advantages that will emerge when systems are designed around the PCMCIA bus. For example, PC Cards have low power requirements (National Semiconductor's LAN adapters require just 1.2 watts maximum, 0.8 watts typical). Systems using them will require smaller power supplies. Again, this will make it hard for certain vendors to inhibit expansion by underpowering their systems to the point that third-party manufacturers have a problem designing enhancements.

Furthermore, a PCMCIA system with its smaller power supply, hard drive, CD-ROM, and floppy should have a footprint about the size of a shoe box. That's not only great for LAN workstations, it's great for any cost-conscious consumer too. Manufacturing efficiencies have brought today's PCs to the point where they're practically priced by the pound. So smaller PCMCIA systems will further reduce hardware prices once demand kicks into play.

It's unnecessary to open your computer to add your network adapter—merely plug in a PC Card.

Cards too. Barry George, D-Link's vice president of marketing, says his PCMCIA adapter "will have a projected cost lower than any of my current internal adapters." Finally, PCMCIA can provide the same bus for the PC that it provides for other architectures such as Mac, UNIX, and PDA. This interoperability will further increase the market for PC Cards and continue to drive prices lower.

All of that's great for buyers, but not the main reason why vendors are going to climb aboard in droves. The main reason you'll be able to select PCMCIA-bus PCs from many vendors is that mass retailers are going to love them, and pull them into their huge marketing channel.

Mass merchandising isn't about knowledgeable sales staff. It's about products that sell themselves. Retailers want impulse items that sell in blister packs, not gadgets that have to be installed by technicians. That's practically the very definition of the PCMCIA bus. So vendors that offer PCMCIA machines will sell more—a goal of every major vendor. The last year has shown that companies—e.g. Compaq and Apple—that lower prices also increase sales and, in the case of Apple, make record profits. Doldrums-bound IBM has reorganized to follow suit. PCMCIA will sell more, and with lower production costs, make more money at lower prices.

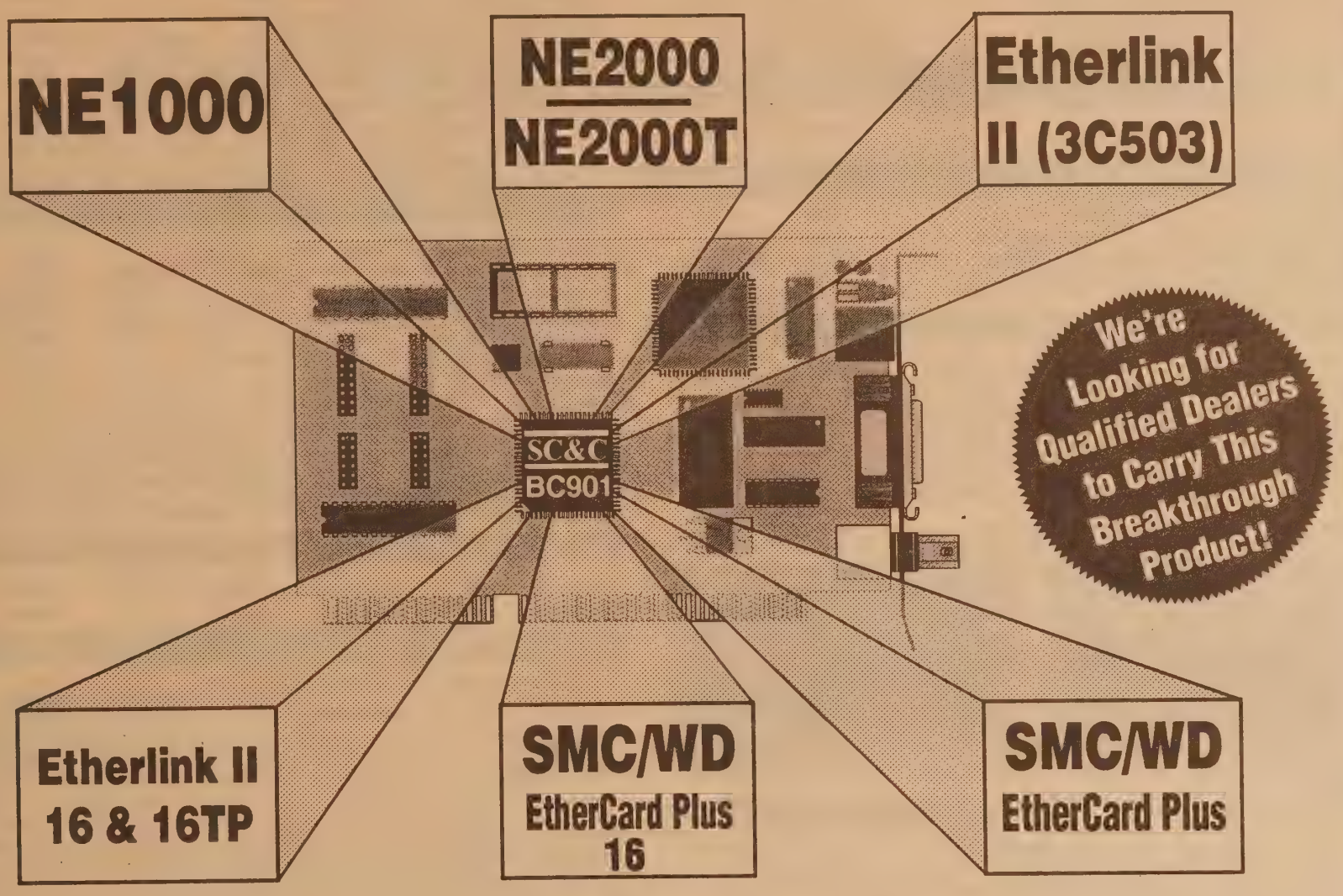
PCMCIA ON THE DESKTOP

I could be wrong, but all this seems inevitable. George seems to agree. "The PCMCIA market is more than a portable market," he says. "It's an efficient and time-saving standard for corporations to install and maintain desktop machines."

The technology is ready. Socket Services is the BIOS-level interface that provides access to the host computer's PC Card slots (sockets). Socket Services identifies the number of available sockets, detects the insertion or removal of cards (allowing hot swaps), and interfaces with Card Services. Card Services provides the interface that manages software;

Continued on page 50

A Step Ahead of the Competition



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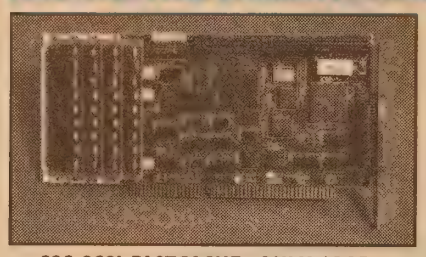

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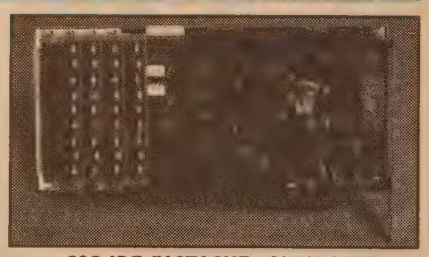

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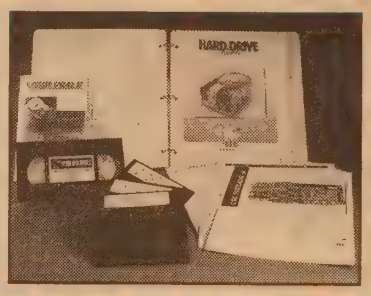

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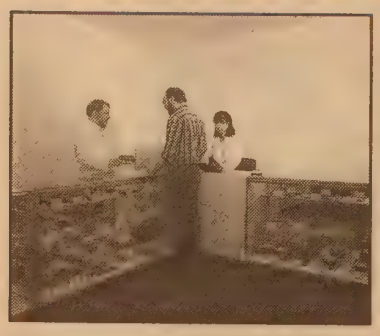

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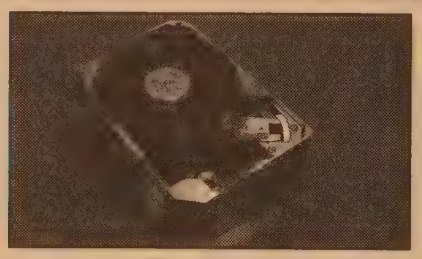

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The New And The Old

The Mach386 Hybrid From Mt. Xinu

BY BENNETT FALK

UNIX

There was a time when people thought that the only reliable knowledge was old knowledge, and proving anything was mostly a matter of finding the most ancient and revered authority who supported the thing to be proved and hoping no one else would cite a more ancient and revered authority in support of a contrary position. Thinking about things in this way precipitated a brisk business in forged antiquities, new books attributed to ancient authors.

Eventually keeping track of the ancient and revered authorities became problematic. Some people decided that things could be known reliably on the authority of their own experience, thank you very much, and in a few years there were people who thought the only reliable knowledge was new knowledge.

1993 will be the year the software industry indulges its fascination with "new technology." We are already caught up in something like an ideological war between novelty and legacy. One of the objectives in this war is to foster the conviction that "new" and "old" are intrinsic properties of products. Some products, it is claimed, represent "new" technology. By inference, anything that lacks the features of the "new" products must be "old," and the further jump from being old to being antique seems almost inconsequential.

Novelty, of course, is a tricky thing: It is no mean feat to convince anyone that something new can be more reliable than something that has worked perfectly well for years. Nor is it easy to describe new technology without constantly referring to its predecessors. There is more continuity between new things and old things than one might expect from listening to marketing pitches.

Before getting lost trying to figure out what new and old are, it may be worthwhile to have a look at a hybrid product that shows some of each.

Copyright © 1993 by Bennett Falk. All rights reserved. *Bennett Falk lives in the Bay Area, writes when he can, and hopes for the best. He works for Sybase, but the opinions and attitudes expressed are his own.*

MACH386

Mach386 release 2.5 is an operating system based on Mach from Carnegie Mellon University and fully compatible with the 4.3 release of Berkeley UNIX (4.3BSD). Mach386 is a product of Mt. Xinu (510/644-0146) in Berkeley, a small company renowned for championing various incarnations of Berkeley UNIX and having a sense of humor.

As the name implies, Mach386 is an operating system designed to run on computers using the Intel 80386 microprocessor. (Mach is probably best known to the general public as the operating system bundled with NeXT computers. It should be noted that NeXT's graphical user interface is not part of the Mach386 package.)

Implementations of Berkeley UNIX for small computers using Intel processors are not numerous. Sun Microsystems ventured briefly into this territory five years ago with its 386i hardware. In the last two years, *Dr. Dobb's Journal* featured a series of articles describing the project of porting Berkeley UNIX to the 386. Mach386 is a rarity: a generic BSD system for 386-based PC-AT class hardware.

Implementations of Berkeley UNIX for small computers using Intel processors are not numerous. Sun Microsystems ventured briefly into this territory five years ago with its 386i hardware. Mach386 is a rarity: a generic BSD system for 386-based PC-AT class hardware.

Mach386 is shipped in an almost ludicrously small package that contains only the diskettes and a slim, staple-bound paperback manual. This is refreshing in a time when UNIX software commonly ships with three shelf-feet of documentation.

A full set of documentation is provided on diskette, but clearly you'll have to get through the installation successfully to make any use of it. Using the online documentation, I was surprised at how careless I've become in reading manuals. Configuring the system to use a serial mouse and setting up the configuration files for the "tip" program required several iterations of reading the manual and experimenting. The Mach386 documentation needs to be read carefully.

Installing Mach386 is relatively easy. The hardest part of the procedure is disk initialization. Mach386 expects to coexist with MS-DOS on hard disks, and the installation worked quite well on a disk that contained some MS-DOS partitions and some free partitions that could be used by Mach386. Incorporating an entire SCSI disk whose only partition table had been created by a non-DOS operating system was less straightforward.

Like any version of UNIX for a "generic" architecture, Mach386 includes a list of officially supported hardware. The Mach386 list is not as comprehensive as the list for, say, SCO UNIX or Interactive UNIX, and the list is quirky in some respects. The Microsoft Bus Mouse is not supported, for example, and the descriptions of VGA boards in the X Windows setup seem to have a number of blind spots. (In fairness, it looks like the configuration can be adjusted to accommodate just about any board available, but you have to know a lot about your board to succeed.)

Still, the system is generally robust. It installed easily and ran well on a now-ancient 16MHz Wyse 386 PC with 6MB of memory, a built-in hard disk, an external SCSI disk on an Adaptek controller, a Compaq VGA card, and a Microsoft Serial Mouse. Trying to run Mach386 with less than 6MB of memory is probably not wise. Running both Mach386 and X Windows comfortably will require 8 to 12MB.

The software bundled into Mach386 is a very generous package, including most of the features that one expects from Berkeley UNIX which might be regarded as add-on products for other UNIX releases. The basic Mach386 operating system supports socket-based networking using either Ethernet or serial lines. (There is a network development package

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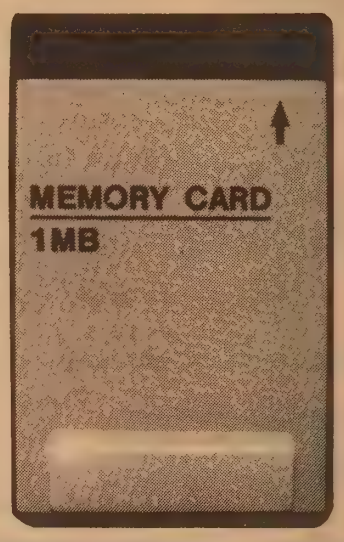

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that can be added to the base setup.) There are also utilities to manage network news.

The base package includes a complete development system with gnu extensions (bison, emacs, gcc, and gdb). A GUI using X Windows is also available as a package separate from the base operating system.

The distribution depends on uucp, SLIP, and tip for communicating with other computers via modem, and it would have been very helpful if a better interactive communication package (something on the order of Kermit) had been included. Somewhere there are undoubtedly Korn Shell devotees who will complain over the absence of the Korn Shell.

In general the system's performance is very good. Using the truly venerable UNIX benchmark tests based on those first published by David in *BYTE* Magazine 1983, Tables 1–4 below show Mach[386]'s performance in several key categories. The results of the same tests on older versions of XENIX and SCO UNIX are included as well. All figures presented are the averages of ten iterations of the whole test suite; all the tests were run on the same hardware (XENIX was tested using only 2MB of memory.)

The tests that were run fall into four categories. The CPU-intensive tests measure speed of computation ("sieve"), system call efficiency ("scall"), looping efficiency

Continued on page 155

TABLE 1

CPU-INTENSIVE TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Executing fcalle			
	0.34	0.32	0.261
	0.2	0.2	0.202
	0	0	0.02
Executing fcalla			
	0.13	0.12	0.103
	0	0	0.045
	0.01	0	0.024
Function Call Overhead			
	0.21	0.20	0.158
Executing loop			
	1.8	1.91	1.009
	1.7	1.8	0.937
	0.03	0.04	0.029
Executing scall			
	2.45	3.04	2.535
	0.25	0.32	0.218
	2.13	2.65	2.239
Executing sieve (100 iterations 1899 primes)			
	9.05	10.42	5.134
	8.9	10.28	5.044
	0.04	0.03	0.04

TABLE 2

DISK-INTENSIVE TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Executing dwrite			
	0.33	0.5	1.38
	0	0	0
	0.25	0.24	0.171
Executing dread			
	0.65	0.35	0.377
	0	0	0.006
	0.23	0.26	0.247
Executing pipes			
	1.23	1.28	1.294
	0	0	0.013
	0.53	0.62	0.714

TABLE 3

MULTIUSER TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Shell 1			
	2.47	1.83	1.702
	0.08	0.1	0.104
	0.6	0.58	0.594
Shell 2			
	2.18	2.66	2.202
	0.18	0.19	0.21
	1.2	1.11	1.139
Shell 3			
	3.45	3.76	3.257
	0.18	0.34	0.325
	1.86	1.62	1.725
Shell 4			
	3.86	4.59	4.309
	0.31	0.43	0.415
	2.32	2.29	2.298
Shell 5			
	4.77	5.74	5.362
	0.38	0.6	0.513
	2.91	2.9	2.913
Shell 6			
	5.71	6.71	6.594
	0.48	0.68	0.617
	3.53	3.6	3.472

TABLE 4

COMPILER TESTS

	XENIX 2.1 2MB	UNIX 3.2.2 6MB	Mach 2.5 6MB
Compiling dwrite.c			
	4.76	4.1	3.286
	1.11	1.14	0.796
	1.39	1.18	0.778
Compiling dread.c			
	3.4	3.45	2.225
	1.11	1.17	0.878
	1.12	1.15	0.805
Compiling fcalle.c			
	2.81	2.6	1.401
	0.7	0.54	0.389
	0.99	0.86	0.541
Compiling fcalla.c			
	2.62	2.58	1.308
	0.57	0.45	0.351
	1.03	0.84	0.542
Compiling loop.c			
	2.83	2.92	1.578
	0.65	0.57	0.416
	1.07	0.98	0.733
Compiling pipes.c			
	3.1	3.16	1.962
	0.94	0.86	0.736
	1.08	1.02	0.768
Compiling scall.c			
	2.73	2.51	1.437
	0.62	0.41	0.363
	1.02	0.82	0.534
Compiling sieve.c			
	3.01	3.29	1.89
	1.07	0.96	0.687
	1.04	0.9	0.735

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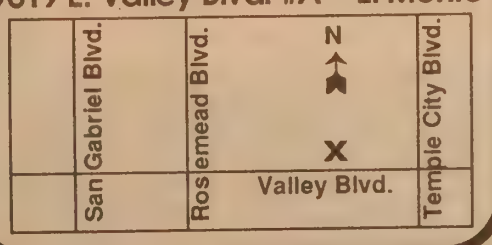

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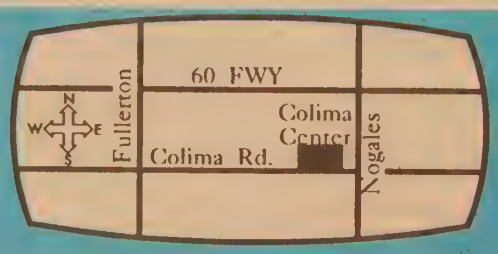

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Continued from page 38

increasingly eager to expand the telework option for employees as a way of streamlining the organization and improving productivity, is now starting to encourage this group to explore the potential for working from home one or more days per week.

RECENT STUDIES SHOW...

PacBell's telecommuting program began in August of 1984, mostly in response to the Olympics held in Los Angeles that year. Following an explicit request to reduce the number of employees commuting to and from work on the city's freeways during the Olympic period, PacBell included as one of its list of alternative work options the chance to telecommute from home or from an outlying office. Telecommuting was so well received and worked so smoothly that PacBell immediately put together a task force to oversee a formal pilot program, which began in May of 1985 with just one hundred telecommuters. Six months later, the task force conducted a formal survey of the telecommuting employees and pronounced the program to be very successful. Productivity was up. Morale was up. Costs were down. And there were no major problems caused by the telecommuting work habits of the pilot program participants.

The decision was made to expand. By May of 1986, a second survey found the telecommuting workers had continued to perform well and had created no serious problems for their colleagues who worked five days per week in PacBell offices. The number of telecommuters continued to grow until it peaked at about two thousand in 1987.

A third survey conducted in 1988 found that telecommuters and their coworkers were still satisfied and still productive. But the disbanding of the company's telecommuting task force and the lack of any program advocate was contributing to a gradual dwindling of participant numbers. This was also about the time that PacBell's new emphasis on early retirement began to systematically reduce the number of telecommuters within the company. A fourth survey during 1989 to assess attitudes within PacBell found continuing satisfaction and success, and led to the development of a formal policy on telecommuting, officially promulgated during the winter of 1989.

Rather than dictate exactly how telecommuters must behave, PacBell's broad policy gives supervisors considerable room to tailor each telecommuting arrangement to meet the particular needs of any department, any position, and any eligible employee.

A fifth company-wide evaluation of telecommuting, conducted in early 1992, produced numbers showing an intensely interested senior management at PacBell that telecommuters were still satisfied, still productive, and still appreciative of the opportunity to eliminate some of their trips to the office. For the fifth time out of five surveys, supervisors expressed no major dissatisfaction with telecommuting and mentioned no major problems caused by the program.

A SUCCESSFUL POLICY

As of today, the program is firmly embedded within PacBell's everyday organizational structure. For example, there is no longer any form of unified telecommuting "program," and no company-wide program administrator or coordinator. Responsibility for making and overseeing specific arrangements with individual telecommuters has been passed directly to the company's departmental supervisors, who are encouraged to make their decisions regarding telecommuters on a case-by-case basis.

According to Carol Nolan, PacBell's resident "Telecommuting Expert" who formerly ran the program and who still acts as a consultant for outside companies considering telecommuting as an option for their employees, "Pacific Bell's telecommuting program is deemed a success, all the way up to the highest levels. We've evaluated it many times for productivity, cost to the organization as a whole, and so forth, and we're very pleased. Our employees are extremely satisfied with telecommuting. In fact, many tell us they would have quit—taking with them our entire investment in their training and experience—if we had not given them the option of working from home part of the time."

Because there is no overall telecommuting coordinator or administrator, any PacBell employee who thinks he or she might want to start telecommuting starts the process by going to his or her supervisor and asking about a telecommuting arrangement. If the supervisor is agreeable, they review PacBell policy and see if the employee is eligible for telecommuting. Most salaried workers are.

Assuming the employee is eligible, the supervisor and employee then work out the details together:

Where will the employee work? At home, or at a PacBell satellite office near home? PacBell currently has two satellite centers: one in North Hollywood to serve downtown Los Angeles, and—curiously—one in downtown San Francisco to accommodate those whose jobs were transplanted thirty miles away to San Ramon.

What equipment will the employee need? PacBell policy allows for the company to supply any needed equipment, from paper and pencils to a portable computer and modem. But the policy—intended to be as flexible as possible—is careful not to require that a telecommuter use any equipment more complicated than a telephone.

Excerpts From Pacific Bell's Telecommuting Policy

Definition: Employees "telecommute" when, on a periodic basis, during their scheduled work hours, they fulfill their job responsibilities at a site other than their primary business location by substituting telecommunications for work-related travel.

Pacific Bell considers telecommuting to be a viable management [salaried employee] work option that, when appropriately applied, benefits both the company and the individual.

Telecommuting is a cooperative arrangement between a supervisor and a management employee, not an entitlement, and is based on: the needs of the job, work group, and company; and the employee's past and present levels of performance.

Jobs suitable for telecommuting are characterized by clearly defined tasks and deliverables. A telecommuter's performance is measured by results, not work location.

Telecommuting does not change the basic terms and conditions of employment.

Each telecommuting arrangement will be cost-justified, subject to benefit tracking and reviewed for continued mutual benefit at regular intervals.

Each telecommuting arrangement is jointly agreed between supervisor and employee; telecommuting is voluntary and may be terminated at any time, at will, by either the company or the employee.

What work will the employee perform? Some tasks are suitable for telecommuting, others are not. It's important that the supervisor and employee determine exactly what parts of the job can be accomplished away from the office, and what parts cannot.

What hours will the employee work? Although many teleworkers enjoy the freedom of working unusual hours, it's important that they be available some portion of the normal workday so they can more easily coordinate with others and respond to coworkers' needs.

By what means will the employee's supervisor get in touch with him or her during working hours, and how will the employee communicate with others in his or her workgroup?

What will be the employee's performance objectives? How will they be measured? How often?

When all the details are agreed upon, the supervisor and employee execute an agreement, date and sign it just like a contract. This not only makes clear to the employee the importance of adhering to these requirements, it gives the supervisor confidence that the employee knows exactly what is and is not expected while working away from the office.

TRAINING AND BEYOND

At one time, there was a required training program for PacBell's telecommuters. But when telecommuting began to be decentralized, training began to be de-emphasized. So far, this appears to have had very little impact on productivity or employee satisfaction with telecommuting. However, a PacBell subsidiary, Telesys Management Institute, has just begun to develop and offer two separate but coordinated training programs for teleworkers and for their managers. Based on the training curriculum originally developed and used during the early years of telecommuting at PacBell, these new training programs remain optional so far.

Rather than dicate exactly how telecommuters must behave, PacBell's broad policy gives supervisors considerable room to tailor each telecommuting arrangement to meet the particular needs of any department, any position, and any eligible employee.

According to Carol Nolan, "the kind of high-level employees who tend to get involved with telecommuting also tend not to need training in how to be self-disciplined and self-motivated, how to keep in touch with coworkers, or how to handle the responsibility of working alone at home."

Next month: a discussion of satellite centers, including those owned and operated by an individual employer and those set up and run by independent firms for use by employees of any interested organization. ■

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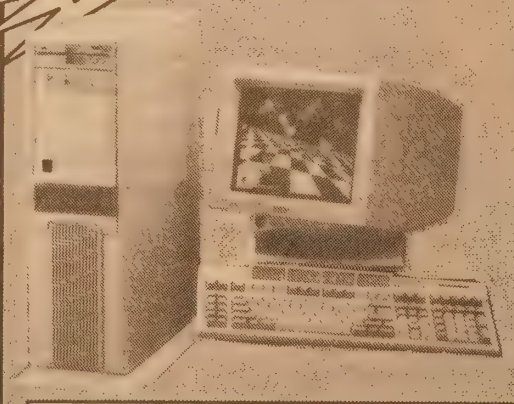

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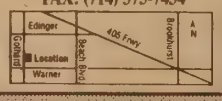

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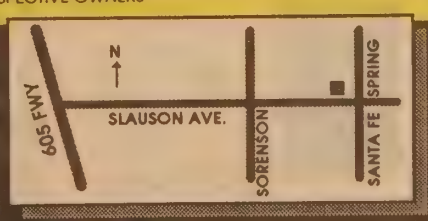

Continued from page 40

it allocates and releases system resources, such as memory and interrupts, for PC Cards as their insertion and removal are detected by Socket Services. Card Services also provides the interface necessary to load hardware drivers.

Intel has also provided some silicon glue to ease the implementation of PCMCIA on PC motherboards. Its ExCA (Exchangeable Card Architecture) has been adopted by twenty-nine mobile-computer vendors and all major BIOS vendors. ExCA allows the vendor of Intel-architecture systems to implement a standard socket. Chips based on the open standard developed by Inte are available from both Intel (the 82365SL ExCA chip) and Cirrus. "By Q1 next year the standard socket issue should be resolved," says Kirby Dyess, mobile business unit manager for Intel's PCED Business Communications Division.

Frankly, I think that the only thing that may delay this evolution from reaching the desktop for as long as two years is Catch-22. Retailers must, regrettably, await the availability of many PC Card add-on choices before PCMCIA computers will sell in the volume required by their channel. So, the process will involve a couple of stages.

First, the choices available at this year's COMDEX will promote development of PCMCIA add-on subsystems for desktop computers (similar to the one in the third-party PowerBook docking station I mentioned last month). They will sit on the desktop, and plug into an ISA adapter or parallel port. This will give more vendors the incentive to hurdle the barrier of PCMCIA's technical demands.

A PCMCIA system with its smaller power supply, hard drive, CD-ROM, and floppy should have a footprint about the size of a shoe box.

In stage two, PCMCIA desktop machines will begin to appear, probably from the makers of small network workstations who will view it as an opportunity to add strength without bulking up. Eventually, the majority of desktop machines could make the transition.

Take this logic a small step further, and PCMCIA 2.01, Sockets Services, and Card Services spell the beginning of the end for the ISA bus. But PCMCIA has potential for more than replacing ISA. Under consideration are strategies for a 32-bit bus with bus mastering. It's potentially everything that EISA or MicroChannel offers, but in a package that will meet the needs of the smallest workstation.

Come to think of it, an array of PCMCIA card slots could just as easily define a sophisticated server. ■

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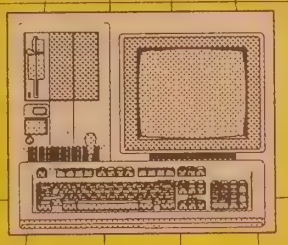

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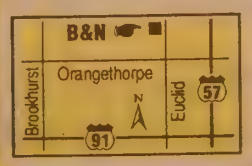

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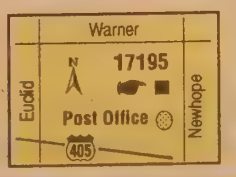

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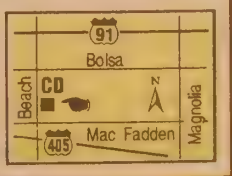

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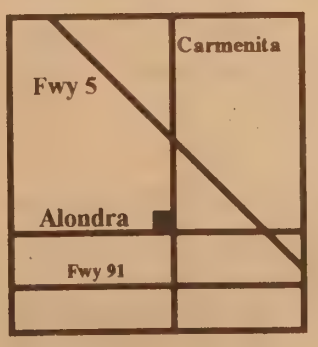
Panasonic 1123 24-pin printer	$196
Panasonic 2123 color printer w/color kit	$290
Panasonic 2124 color printer w/color kit	$375
Colorado tape backup 120MB	$195
Colorado tape backup 250MB	$245
Orchid Fahrenheit VA (Voice Annotation)	$195

D.C. Computer, Inc.



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Santa Fe Springs, CA 90670
FAX: (310) 802-2662

Business Hours:
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Saturday 10am-6:00pm

Tel: (310) 926-9331

PREVIEW:

The Third Conference On Computers, Freedom, And Privacy—CFP'93

March 9–12, 1993

San Francisco Airport Marriott Hotel

Burlingame, CA

The advance of computer and telecommunications technologies holds great promise for individuals and society. From convenience for consumers and efficiency in commerce, to improved public health and safety and increased participation in democratic institutions, these technologies can fundamentally transform our lives.

At the same time, these technologies pose threats to the ideals of a free and open society. Personal privacy is increasingly at risk from invasion by high-tech surveillance and eavesdropping. The myriad databases containing personal information maintained in the public and private sectors expose private life to constant scrutiny.

Technological advances also enable new forms of illegal activity, posing new problems for legal and law enforcement officials and challenging the very definitions of crime and civil liberties. But technologies used to combat these crimes can pose new threats to freedom and privacy.

Even such fundamental notions as speech, assembly, and property are being transformed by these technologies, throwing into question the basic Constitutional protections that have guarded them. Similarly, information knows no borders; as the scope of economies becomes global and as networked communities transcend international boundaries, ways must be found to reconcile competing political, social, and economic interests in the digital domain.

The Third Conference on Computers, Freedom, and Privacy will assemble experts, advocates, and interested people from a broad spectrum of disciplines and backgrounds in a balanced public forum to address the impact of computer and telecommunications technologies on freedom and privacy in society. Participants will include people from the fields of computer science, law, business, research, information, library science, health, public policy, government, law enforcement, public advocacy, and many others.

CFP'93 registration will be limited to 550 attendees, so we advise you to register as early as possible and take advantage of the early registration discounts.

REGISTRATION FEES ARE:

If mailed by:	7 February	8 March	on site
Conference Fees:	$300	$355	$405
Tutorial Fees:	$135	$165	$195
Conference & Tutorial	$435	$520	$600

For registration and other information, contact Bruce Koball, General Chair, CFP'93 , 2210 Sixth Street, Berkeley, CA 94710. Phone: (510)845-1350. Fax: (510)845-3946. Internet mail: cfp93@well.sf.ca.us

Sponsored by: Association for Computing Machinery, Special Interest Groups on Communications (SIGCOMM), Computers and Society (SIGCAS), Security, Audit, and Control (SIGSAC)

COSPONSORS AND COOPERATING ORGANIZATIONS:

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Commission for Liberties and Informatics
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Electronic Frontier Foundation
Freedom to Read Foundation
IEEE Computer Society
IEEE-USA Committee on Communications and Information Policy
Internet Society
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Privacy International
USD Center for Public Interest Law
U.S. Privacy Council
The WELL (Whole Earth 'Lectronic Link)

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PRE-CONFERENCE TUTORIALS:

On Tuesday March 9, the day before the formal conference begins, CFP'93 is offering a number of in-depth tutorials on a wide variety of subjects on four parallel tracks. These presentations will range from interesting and informative to thought-provoking and controversial. The tutorials are available at a nominal additional registration cost.

MORNING TUTORIALS

INFORMATION USE IN THE PRIVATE SECTOR

Jack Reed, Information Resource Service Company
Diane Terry, TransUnion Corp.
Dan Jones, D.Y. Jones & Assoc.

This tutorial will deal with the use of personal information from the point of view of some private sector information vendors and users. It will include a discussion of the Fair Credit Reporting Act and the "Permissible Purposes" for obtaining a consumer credit report. Information used for purposes outside the FCRA will be discussed in relationship to privacy and societal needs for businesses and individuals.

ACCESS TO GOVERNMENT INFORMATION

James Love, Director, Taxpayer Assets Project

This tutorial will examine a wide range of problems concerning citizen access to government information, including how to ask for and receive information under the federal Freedom of Information Act, what types of information government agencies store on computers, what the barriers are to citizen access to these information resources, and how citizens can change government information policy to expand access to taxpayer- funded information resources.

Continued on page 59

EZ COMPUTER

BLOW-OUT SPECIALS!

EPSON LQ 570 ONLY $245! EPSON ACTION PRINTER ONLY $135!

486DX-33 w/64K CACHE $1010

486SX-25 $885

SYSTEMS INCLUDE:

- 1MB RAM Installed
- 85MB IDE Hard Disk Drive
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- 48 Hour Turnaround Time On Repair & Service

386DX-40 w/64K CACHE $750

386SX-33 $680

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BUSINESS HOURS Mon.- Sat. 9am-7pm

486DX-33 w/256K CACHE $600

486SX-25 $450

386DX-40 w/64K CACHE $320

386SX-33 $260

386SX-25 $255

486DX-50 w/256K CACHE $800

286DX-20 $210

SYSTEMS INCLUDE:

- Mini Tower Or Desktop
- 200W Power Supply
- 1MB RAM Installed
- 1.2 Or 1.44 Floppy Drive
- Dual FDD & HDD Controller
- 2 Serial/1 Parallel/1 Game Port
- Real Time And Clock
- 101 Enhanced Click Keyboard
- 1 Year Parts Warranty
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- 48 Hour Turnaround Time On Repair & Service

NOTEBOOK SPECIAL!

486DX2-50 (4MB) 210MB HD $2250

486SX-25 (4MB) 80MB HD $1540

386DX-33 (4MB) 80MB HD $1470

INCLUDES

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Database
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TSENG ET 4000 w/1MB	$95
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250MB Tape Backup(Colorado)	$225
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- Build-in Trackball Mouse (Color Only)
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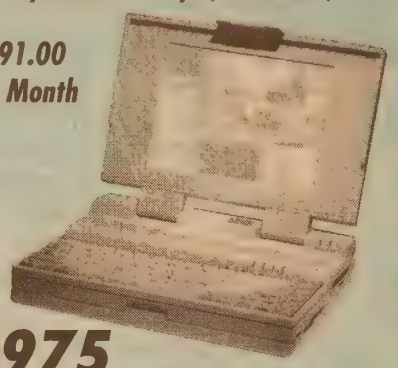
- Carrying Bag & AC/DC Adapter

NP-206M, 486DX-33, 4/120MB $1975
NP-209M, 486DX2-50, 4/120MB $2175

$ 91.00 Per Month



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- 4MB RAM on board expandable to 16MB
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COLOR

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386SXL-25 MHz

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- 86-Key with 12 Function Keys
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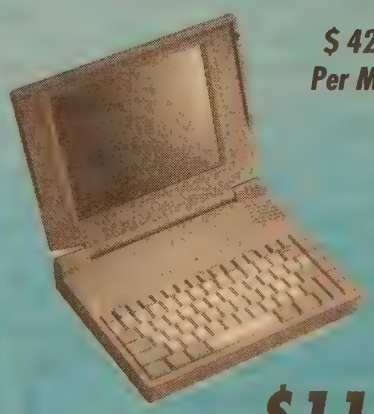
- 1 Internal Fax/Modem Port
- 11"W x 8.4"D x 1.8"H
- Carrying Bag & A/C Adapter

$ 42.00 Per Month



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- With sheet feeder up to 30 Sheet
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- So fast and so quiet at 45 dBA
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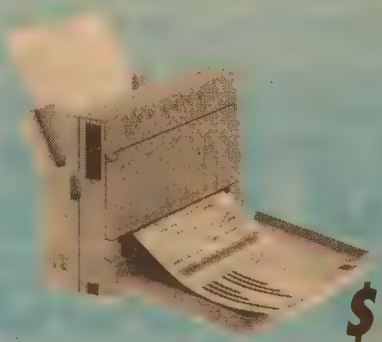

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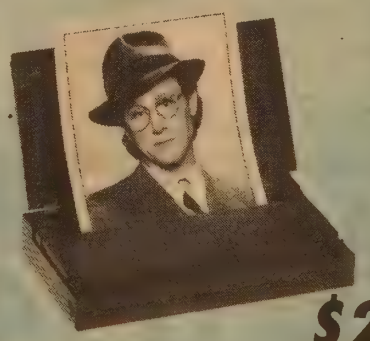
Canon Bubble Jet BJ-10EX

Plain Paper Portable Inkjet Printer

- Manual Feed
- 142 Characters/ Second
- 360 DPI > 6.6 lbs.
- 37 KB Buffer
- Epson/IBM Emulation
- Laser Quality Text & Graphics



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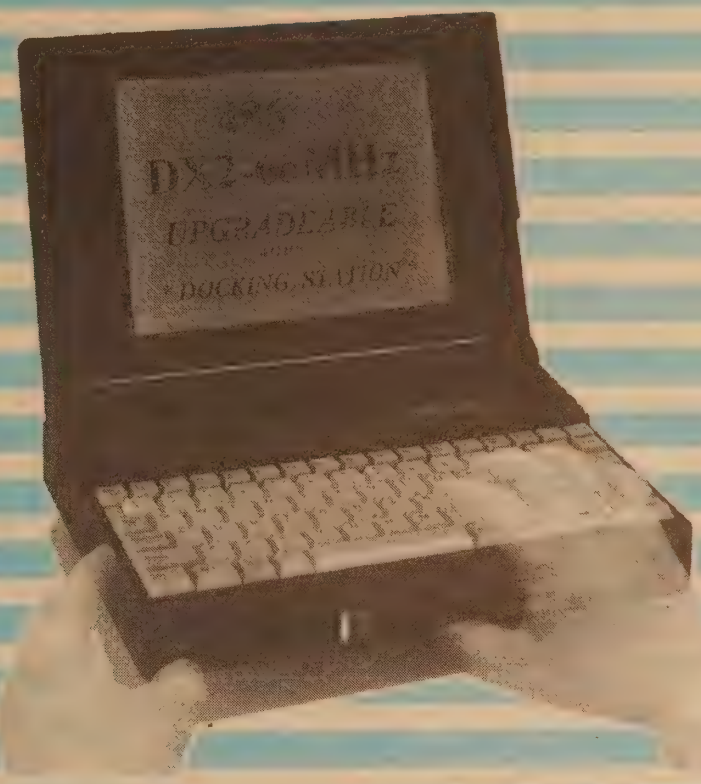

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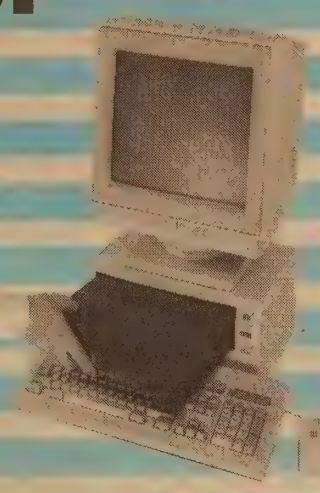

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AMREL Docking Station delivers the power and expandability of desktop PCs to your MLT486. Features include two 16-bit ISA slots, internal Fax/Modem, RS232 port, parallel port, SVGA, external keyboard port and room for a 5 1/4" drive.

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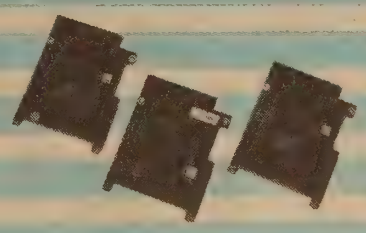

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Convenient built-in trackball eliminates the need for awkward add-on devices.

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- 96/2400 INT FAX /MODEM

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10" BLACK/WHITE SUPERTWIST BACKLIT DISPLAY; ADJUSTABLE BRIGHTNESS AND CONTRAST, 640 X 480 RESOLUTION, VGA COMPATIBLE 64 SHADES OF GREY, 80 CHARACTERS X 25 LINES SIMULTANEOUS EXTERNAL COLOR SVGA

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RS-232C SERIAL PORT, PRINTER PORT, EXTERNAL MONITOR PORT, EXTERNAL KEYBOARD PORT, DOCKING STATION , FAX/MODEMINTERFACE

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AUTO SENSING 110V/240VAC, 50-60HZ, NI-CAD RECHARGEABLE BATTERY PACK WITH 3-HOUR OPERATION, LOW BATTERY WARNING AND SHUT DOWN

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UNIVERSAL AC/DC ADAPTOR, ONE BATTERY, DELUX CARRYING BAG EXTERNAL KEYBOARD ADAPTOR, UTILITY DISK, BUILD-IN TRACKBALL MOUSE, AUTO SUSPEND BUTTON

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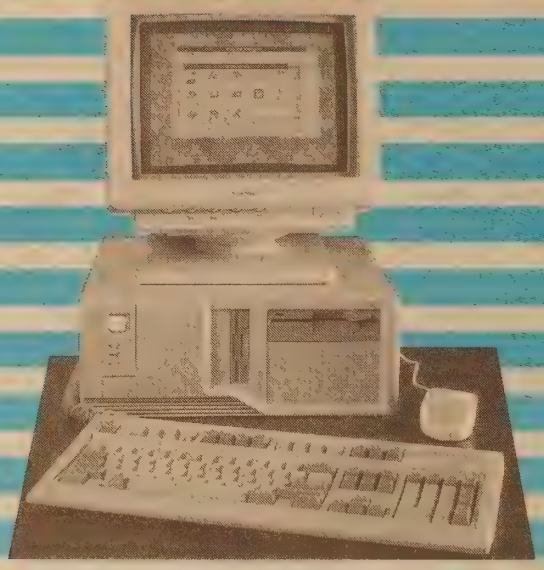

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W/2 VESA LOCAL BUS SLOTS

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- 256K cache
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- VESA 32 Bit IDE Card w/2 Serial, 1 Parallel, 1 Game
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- 256K cache
- 4MB RAM up to 32 MB on board
- 1.2MB & 1.44MB Floppy Drives
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- IDE Card w/2 Serial, 1 Parallel, 1 Game
- SVGA card 16 bit w/1MB
- Tatung 14" 1024x768 .28 dot color Monitor
- 101 key Enhanced Keyboard

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486DX-33MHz

- 486DX-33 MHz Processor
- 64K cache
- 4MB RAM up to 32 MB on board
- 1.2MB & 1.44MB Floppy Drive
- 120MB Hard disk
- IDE Card w/2 Serial, 1 Parallel, 1 Game
- SVGA card 16 bit w/1MB
- Tatung 14" 1024x768 .28 dot color Monitor
- 101 key Enhanced Keyboard

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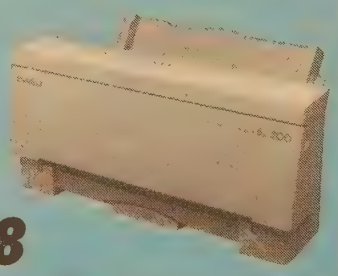

$ 348

486SX-25MHz

- 486SX 25MHz Processor
- 64K cache
- 4MB RAM up to 32 MB on board
- 1.2MB & 1.44MB Floppy Drive
- 120MB Hard disk
- IDE Card w/2 Serial, 1 Parallel, 1 Game
- SVGA card 16 bit w/1MB
- Tatung 14" 1024x768 .28 dot color Monitor
- 101 key Enhanced Keyboard

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- 4MB RAM up to 32 MB on board
- 1.2MB & 1.44MB Floppy Drive
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(Dble function Keys, Calculator etc.)	
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14.4 Fax/Modem V.42, V.42BIS, V.32, V.32BIS Ext.	$ 250.00
96/24 Fax/Modem Int W/Super Fax	$ 69.00
IDE Card w/2 serial, 1 Parallel, Game	$ 25.00

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Continued from page 54

EXPLORING THE INTERNET—A GUIDED JOURNEY
Mark Graham, Pandora Systems
Tim Pozar, Late Night Software
This tutorial will give participants a practical introduction to the most popular and powerful applications available via the world's largest computer network, the Internet. There will be hands-on demonstrations of communications tools such as email, conferencing, Internet Relay Chat, and resource discovery and navigation aids such as Gopher, WAIS, Archie, and World Wide Web. Extensive documentation will be provided.

CONSTITUTIONAL LAW FOR NON-LAWYERS (1/2 SESSION)
Mike Godwin, Staff Counsel, Electronic Frontier Foundation
This tutorial is designed to inform non-lawyers about the Constitutional issues that underlie computer-crime and computer civil-liberties cases. The tutorial focuses on the First and Fourth Amendments, but includes a discussion of the Fifth Amendment and its possible connection to the compelled disclosure of cryptographic keys. It also includes a discussion of the appropriateness of "original intent" as a method for applying the Constitution in the modern era.

CIVIL LIBERTIES IMPLICATIONS OF COMPUTER SEARCHES & SEIZURES (1/2 SESSION)
Mike Godwin, Staff Counsel, Electronic Frontier Foundation
This tutorial assumes only a very basic knowledge of Constitutional law (the prior tutorial provides an adequate background), and outlines how searches and seizures of computers may raise issues of First and Fourth Amendment rights, as well as of federal statutory protections. It includes a discussion of what proper search-and-seizure techniques in such cases may be.

AFTERNOON TUTORIALS

PRACTICAL DATA INFERENCING: WHAT WE THINK WE KNOW ABOUT YOU
Russell L. Brand, Senior Computer Scientist, Reasoning Systems
What do your transaction trails reveal about you? Are you a good risk to insure? Are you worth kidnapping, auditing, or suing? Which products should I target at you? Are you a member of one of those groups that I would want to harass or discriminate against? This tutorial will be a hands-on approach to digging for data and to piecing it back together. Time will be divided between malicious personal invasions and sweeping searches that seek only profit, followed by a brief discussion about improper inferences and their practical impact on innocent files and lives. Legal and moral issues will not be addressed.

TELECOMMUNICATIONS FRAUD
Donald P. Delaney, Senior Investigator, New York State Police
Illegal call sell operations in New York City are estimated to be a billion-dollar industry. This tutorial will provide an overview of the problem, from finger hacking to pay phone enterprises, and will include an up-to-date assessment of the computer cracker/hacker/phone phreak impact on telephone company customer losses. Also discussed will be unlawful access of telephone company switches; unlawful wiretapping and monitoring; cards, codes, and 950 numbers; New York State law and police enforcement; methods of investigation; and case studies.

PRIVATE SECTOR MARKETPLACE AND WORKPLACE PRIVACY
Ernest A. Kallman, Bentley College
H. Jeff Smith, Georgetown University
This tutorial will give participants a general overview of privacy issues affecting uses of personal information (e.g., medical information, financial information, purchase histories) in the marketplace as well as privacy concerns in the workplace (e.g., privacy of electronic and voice mail, work monitoring). The tutorial will also set the boundaries for privacy arguments in the middle and latter 1990s.

SYSLAW
Lance Rose, Attorney and Author, *SysLaw*
The SysLaw tutorial session will explore in-depth the freedom and privacy issues encountered by computer bulletin boards (BBS), their system operators, and their users. BBSes are estimated to number over 45,000 today (not counting corporate systems), and range from small, spare-time hobby systems to systems with thousands of users, grossing millions of dollars. BBSes are a grassroots movement with an entry cost of $1000 or less, and the primary vehicles for new forms of electronic communities and services. Subjects covered will include: First Amendment protection for the BBS as publisher/distributor; data freedom and property rights on the BBS; how far can sysops control BBS user activities?; and user privacy on BBSes today.

Note: Tutorial presenters will offer expert opinions and information. Some may advocate particular viewpoints and thus may put their own "spin" on the issues. Caveat Listener.

CONFERENCE RECEPTION:
Following the Tutorials on Tuesday evening, you are invited to meet new and old friends and colleagues at an opening reception.

SINGLE TRACK MAIN PROGRAM:
The technological revolution that is driving change in our society has many facets and we are often unaware of the way they all fit together, especially the parts that lie outside of our own expertise and interest. The primary goal of CFP'93 is to bring together individuals from disparate disciplines and backgrounds, and engage them in a balanced discussion of all CFP issues. To this end our main program, starting on Wednesday March 10, is on a single track enabling our attendees to take part in all sessions.

EFF PIONEER AWARDS
All conference attendees are invited to the Awards Reception sponsored by the Electronic Frontier Foundation (EFF) on Wednesday evening, March 10. These, the second annual EFF Pioneer Awards, will be given to individuals and organizations that have made distinguished contributions to the human and technological realms touched by computer-based communications.

BIRDS OF A FEATHER SESSIONS:
CFP'93 will provide a limited number of meeting rooms to interested individuals for special Birds of a Feather sessions after the formal program each evening. These sessions will provide an opportunity for special interest discussions that were not included in the formal program and will be listed in the conference materials.

CFP'93 Main Program Sessions:

WEDNESDAY MARCH 10

ELECTRONIC DEMOCRACY
Chair—Jim Warren, MicroTimes and Autodesk, Inc.
The effects of computer and telecommunications technologies on democratic processes and institutions are increasing dramatically. This session will explore their impacts on political organizing, campaigning, access to representatives and agencies, and access to government information that is essential for a free press and an informed electorate.

ELECTRONIC VOTING—THREATS TO DEMOCRACY

Chair—Rebecca Mercuri, University of Pennsylvania

This panel session will invite representatives covering a broad spectrum of involvement with the controversial subject of electronic vote tallying to address such issues as: Is a secure and reliable electronic voting system feasible? What threats to these systems are identifiable? Should electronic voting systems be open for thorough examination? Can auditability be assured in an anonymous ballot setting? Can voting by phone be practical and confidential? Did Congress exempt voting machines from the Computer Security Act?

CENSORSHIP AND FREE SPEECH ON THE NETWORKS

Chair—Barbara Simons, IBM

As online forums become increasingly pervasive, the notion of "community standards" becomes harder to pin down. Networks and BBSes will link—or create—diverse, non-geographic communities with differing standards, laws, customs, and mores. What may be frank discussion in one forum may be obscenity or defamation or sexual harassment in another. This session will explore the questions of what kinds of freedom-of-speech problems face us on the Net and what kinds of legal and social solutions we need.

PORTRAIT OF THE ARTIST ON THE NET

Chair—Anna Couey, Arts Wire

Computer forums and networks make possible both new artforms and new ways of remote collaboration and exhibition. The growth of the Net creates opportunities for the blossoming of dynamic and interactive artforms and of artistic cultures—provided that networks become widely accessible and remain open to artistic expression without political interference. This session will examine the potentials and the problems of art and artists on the Net.

THURSDAY MARCH 11

DIGITAL TELEPHONY AND CRYPTO POLICY

Chair—John Podesta, Podesta and Associates

The increasingly digital nature of telecommunications potentially threatens the ability of law enforcement agencies to intercept them when legally authorized to do so. In addition, the potential widespread use of cryptography may render the ability to intercept a communication moot. This session will examine these issues and the proposals that have been put before Congress by law enforcement agencies to address these perceived problems.

HEALTH RECORDS AND CONFIDENTIALITY

Chair—Janlori Goldman, American Civil Liberties Union

As the new Administration and Congress consider proposals to reform the United States health care system, it is imperative that confidentiality and security safeguards be put in place to protect personal information. Currently, no comprehensive legislation exists on the confidentiality of health information. This session will explore the current and potential uses of health care information, and proposals to safeguard the information.

THE MANY FACES OF PRIVACY

Chair—Willis Ware, Rand Corp.

Privacy at any cost is foolish, unwise and an untenable position, and privacy at zero cost is a myth. This two-part session will explore the balancing act between the two extremes and the costs and benefits that accrue. The first part will present several examples of systems and applications in the public and private sectors that stake out a position in this continuum. The second part will be a panel discussion exploring the issues raised by the examples previously presented.

THE DIGITAL INDIVIDUAL

Chair—Max Nelson-Kilger, San Jose State University

We are all represented by personal records in countless databases. As these records are accumulated, disseminated and coalesced, each of us is shadowed by an ever larger and more detailed data alter-ego, which increasingly stands in for us in many situations without our permission or even awareness. How does this happen? How does it affect us? How will it develop in the future? What can we do? This session will investigate these questions.

FRIDAY MARCH 12

GENDER ISSUES IN COMPUTING AND TELECOMMUNICATIONS

Chair—Judi Clark, Bay Area Women in Telecommunications

Online environments are largely determined by the viewpoints of their users and programmers, still predominantly white men. This panel will discuss issues of freedom and privacy that tend to affect women—such as access, identity, harassment, pornography, and online behavior—and provide recommendations for gender equity policies to bulletin board operators and system administrators.

THE HAND THAT WIELDS THE GAVEL

Chair—Don Ingraham, Assistant District Attorney, Alameda County, CA

An inevitable result of the settlement of Cyberspace is the adaptation of the law to its particular effects. In this session a panel of criminal lawyers addresses the fallout from a hypothetical computer virus on the legal responsibilities of system managers and operators. The format will be a simulated court hearing. Attendees will act as advisory jurors in questioning and in rendering a verdict.

THE POWER, POLITICS, AND PROMISE OF INTERNETWORKING

Chair—Jerry Berman, Electronic Frontier Foundation

This session will explore the development of internetworking infrastructures, domestically and worldwide. How will this infrastructure and its applications be used by the general public? What will the global network look like to the average user from Kansas to Kiev? How will politics, technology, and legislation influence the access to, and cost of, the Net? How can the potential of this powerful medium be fully realized?

INTERNATIONAL DATA FLOW

Chair—George Trubow, John Marshall Law School

The trans-border flow of information on international computer networks has been a concern for governments and the private sector. In addition to concerns for privacy and data security, the economic and national security implications of this free flow of information among scientists, engineers, and researchers around the world are also cause for concern. This session will assemble a number of speakers to compare the various perspectives on the problem.

PARTIAL LIST OF SPEAKERS:

Phillip E. Agre, Department of Communication, University of California, San Diego

Jonathan P. Allen, Department of Information and Computer Science, University of California, Irvine

Sheri Alpert, Policy Analyst, author: "Medical Records, Privacy, and Health Care Reform"

William A. Bayse, Assistant Director, Federal Bureau of Investigation

William Behnk, Coordinator, Legislative Information System, State of California

Jerry Berman, Acting Executive Director, Electronic Frontier Foundation

Paul Bernstein, Attorney

Kate Bloch, Hastings College of the Law

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Preview

Richard Civille, Computer Professionals for Social Responsibility
Roger Clarke, Reader in Information Systems, Department of Commerce, Australian National University
Dorothy Denning, Chair, Computer Science Department, Georgetown University
Robert Edgar, Simon and Schuster Technology Group
Kathleen Frawley, American Health Information Management Association
Emmanuel Gardner, District Manager, Government Affairs, AT&T
Mike Godwin, Staff Counsel, Electronic Frontier Foundation
Joe Green, University of Minnesota
Sarah Grey, computer department, We The People, Brown presidential campaign organization (invited)
Will Hill, Bellcore
Carl Kadie, coeditor, *Computers and Academic Freedom News* newsletter
Mitch Kapor, Chairman, Electronic Frontier Foundation
David Lewis, Deputy Registrar, Department of Motor Vehicles, Commonwealth of Massachusetts
James Love, Director, Taxpayers Assets Project
Judy Malloy, Associate Editor, *Leonardo Electronic News*
Irwin Mann, Mathematician, New York University
David McCown, Attorney
Rob Mechaley, Vice President, Technology Development, McCaw Cellular Communications, Inc.
Robert Naegele, Granite Creek Technology Inc., Voting Machine Examiner, consultant to NY State
Barbara Peterson, Staff Attorney, Joint Committee on Information Technology Resources, Florida Legislature
Jack Reed, Chairman, Information Resource Service Company
Virginia E. Rezmierski, Assistant for Policy Studies to the Vice Provost for Information Technology, University of Michigan
Jack Rickard, Editor, *Boardwatch Magazine*
Randy Ross, American Indian Telecommunications
Roy Saltman, National Institute of Standards and Technology
Barbara Simons, IBM
Robert Ellis Smith, Publisher, *Privacy Journal*
David Sobel, Computer Professionals for Social Responsibility
Ross Stapleton, Research Analyst, Central Intelligence Agency
Jacob Sullum, Associate Editor, *Reason Magazine*
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Greg Tucker, Coordinator, David Syme Faculty of Business, Monash University, Australia
Joan Turek-Brezina, Chair, Health and Human Services Task Force on Privacy of Private-Sector Health Records

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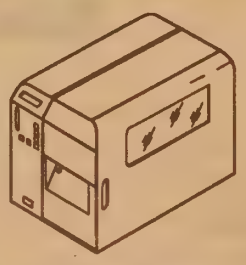

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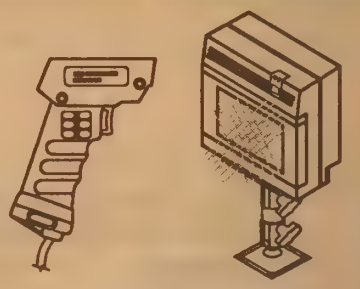

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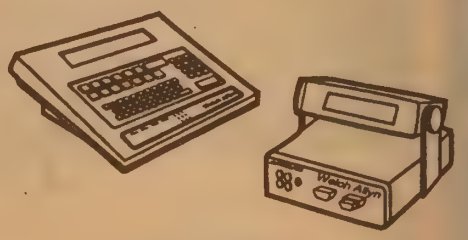

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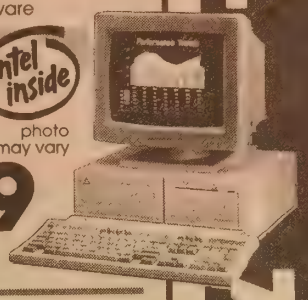

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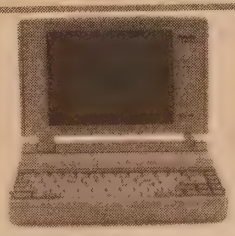

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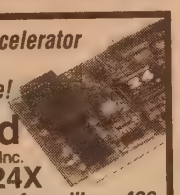

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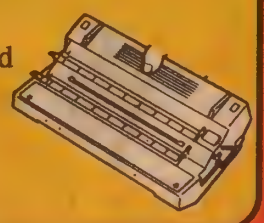

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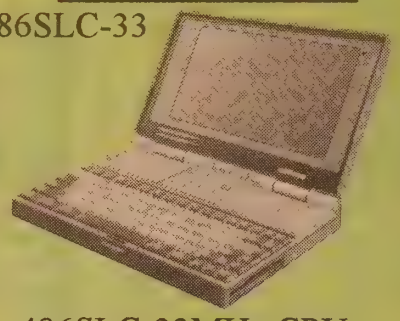

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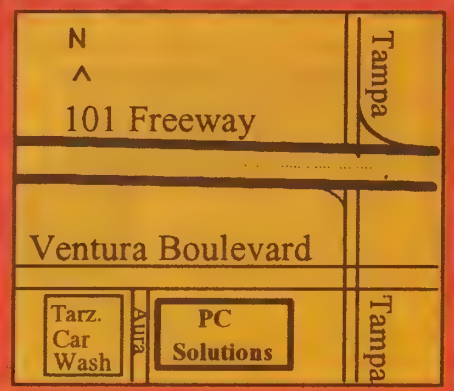

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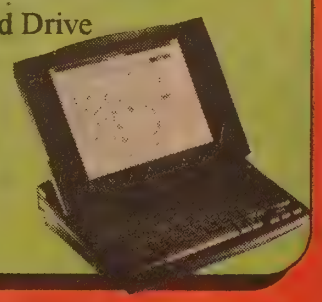

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An Interview With Alain Rossman

L·I·T·T·L·E Paradigm Shift

Personal Communicators From EO

By Mary Eisenhart

The first time I encountered Alain Rossman, he and Guy Kawasaki, then the leading lights of Apple's software evangelism effort, were at AppleFest in Long Beach, putting on an engaging dog-and-pony show designed to induce skeptical Apple II developers to write applications for the Macintosh—the survival of which was, at that point, highly questionable.

Eight years and three companies later, Rossman, his fervor and zeal unimpaired, is once again involved in the launch of a radically new product aimed at customers whose needs aren't being addressed by current computer technology. As president and CEO of EO, Inc., Rossman recently introduced Personal Communicators, tablet-sized devices with a pen-based operating system, plus bundled-in-ROM software that includes electronic mail, fax, a personal organizer, and PC connectivity, not to mention optional cellular phones and modems, at prices ranging from $1999 to $3299.

Since leaving Apple, Rossman cofounded two successful companies, Radius and C-Cube, a leader in video compression technology. In 1991, while serving as vice president of sales, marketing, and operations at C-Cube, Rossman was approached by fellow Frenchman Bernard Lacroute, a veteran of Sun and DEC and a partner at the venture capital firm Kleiner Perkins Caufield and Byers. Lacroute, it seemed, was working on a new startup, and dropped some tantalizing hints.

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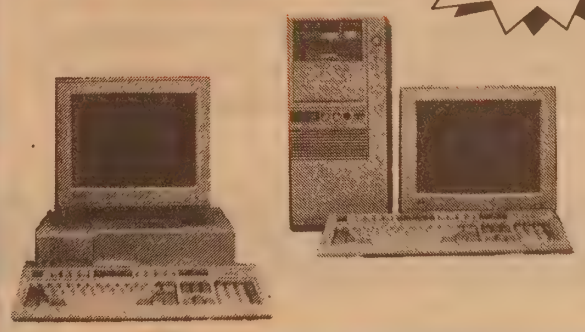

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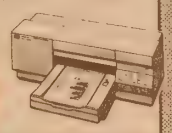

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"It seemed so mysterious and secret," laughs Rossman. "I was very intrigued, and as I talked more to people,I thought there was something incredibly exciting there—really, a convergence of technologies that would potentially allow us to create something new. It's very seldom that you really have the opportunity to create a new concept, a new platform. It's very rare. Companies with incremental improvements can be very successful—that's what Radius was. Those are easier, safer.

"But doing something really new—you only have such a chance every ten years or something. You have to have a combination of things—all the stars have to be aligned right. It's luck. Key technologies just become available, and they reach a threshold of usefulness, and they become cost-effective. Maybe they exist in the lab, but you can't use them, really—and suddenly, boom! there is an opportunity to create something new. The Mac was one such giant opportunity for a real shift and creating something very different.

"So I saw that same thing here, and it was hard then to predict how long it would take, how big it would be eventually, but I was totally convinced it would be very big."

Rossman joined Lacroute's startup when it was a month old, in September 1991. The company was dubbed EO, from the Latin verb "go"—partly because of the connotations of mobility, and partly as a little in-house joke since so many of the company's first employees were recruited from GO (whose PenPoint operating system is integral to the Personal Communicators).

From the outset, EO's founders realized that its products had no chance without some strategic alliances. Says Rossman, "Bernie had thought through that, and concluded that you could not run such an ambitious project without the backing of large corporations. You just couldn't do it.

"If you follow that thread of thought, you go, 'Who are the obvious partners?' And when you do something that's as communication-centric as what we're trying to do, AT&T is it, in the United States. You've got financial depth, you've got technology resources and all the stuff you're looking for. Very shortly thereafter, the deal was closed with AT&T.

"So the company was designed that way from the start. It was not an afterthought—it was the way the business plan was designed."

By December of 1991, the company had investments from AT&T, Matsushita, and Marubeni, as well as venture capital from Kleiner Perkins. In addition to its investment, AT&T contributed vital technology to EO's product—its low-power, high-performance Hobbit RISC chip is the Personal Communicator's CPU, its EasyLink mail service is included with the product, and the Personal Communicators will be sold in AT&T's Phone Centers.

Likewise, Matsushita contributed manufacturing resources and Marubeni, a powerful global trading company, brought worldwide sourcing and distribution support. In addition, the Personal Communicators include applications from GO (in addition to the PenPoint OS, mail, fax, and notepad software are bundled in ROM), Sitka (PenTOPS and PenCentral, which allow the exchange of files with the user's PC), and PenSoft (Personal Perspective, an organizer that includes a calendar, to-do list, address book, and note-taker).

Currently in beta tests at sites including Aetna Insurance and Levi Strauss, the Personal Communicators are scheduled for quantity shipment in the second quarter of this year. As with all risky new technology, of course, it remains to be seen whether EO will go the way of Macintosh or go the way of the now-defunct Momenta.

But in a mood highly reminiscent of the early Macintosh days, Rossman shows a lively awareness of the hazards, and unbounded enthusiasm for the possibilities. (EO, Inc. 415/903-8100)

Clearly what you have is very cool technology, but the Valley is littered with dead companies that had cool technology.

No kidding! *[laughs]*

> "If you look at how the units are used and what they do, you find a lot of commonality. They are used by field personnel—sales, marketing, support, customer-oriented people who are outside of the office a lot. And if you asked the companies we worked with why they want this kind of unit, they all have almost the same goal—they are trying to shorten the information cycle for people far away from the office."

Beyond being cool, the technology has to be useful and have a market. So what do you see as the market here?

[laughs] That's the way you are. You want usefulness.

Well, the people with the checkbooks like usefulness.

[laughs] That's absolutely true.

We think that what we have is not only cool but quite useful. It's clear that it's the first product of a new category that will evolve, that will improve in every dimension. The sophistication of the software three years from now—we'll see a lot of breakthroughs on that front. We'll see more integration. We'll see lower costs. That's the nature of this business. A lot will change over the next few years. The rate of change will be very high because it's so new, because so much has to be invented. We're not in that stabilized form that the PCs have reached.

You're sort of at the 128K Macintosh stage, though given the difference in capability that's not a completely accurate way to look at it.

Exactly. It's new. It's very new. So we have to learn how to make it better, and customers have to learn why they are useful. Both sides are true. Personal Communicators are quite useful today, and they'll be more useful tomorrow, and they'll be cheaper over time.

Now we recognize that it will take a while. I've been through that at Apple—that process of the company learning and the market learning. The Mac *was* useful even when it came out—the truth is it took a while for the market to learn that, and it took a while for Apple to learn how to make it better, too.

I think the same will happen here. You don't escape that, it's just the way things work. It's almost a function of how the human mind works. I still remember the *Wall Street Journal* explaining why the Mac was the most stupid idea they had ever seen—that it had this packet-of-cigarettes-size thing called a mouse on the side that nobody would ever use. They had a whole study on the front page, of how nobody would ever use it, it was very inconvenient...

And those guys were wrong. They had no vision, no understanding of the future. It took a while for those guys to learn and use it, and of course now it's not even a question whether you want a mouse or not. You probably walk into the *Wall Street Journal* office, and they have PCs with Windows and mice everywhere.

That learning process on both sides will take a few years. What that tells us is we have to have staying power.

That's why the Valley's littered with dead companies. Two reasons—one is they really don't do useful things, you're right, they just play with technology. That's not what we think we're doing. We think we're doing something very useful that has to be proved, and has years of innovation and improvement ahead of it.

The other reason is that they had something that could be useful over time, but they didn't get there. They didn't make it. They didn't have the staying power to get there. It would have been great—it just took two more years and they didn't have the money.

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Continued on page 73

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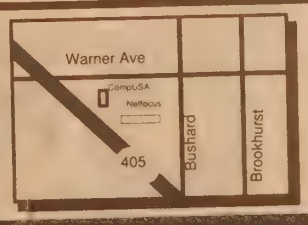

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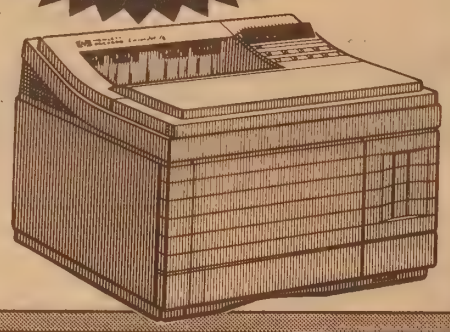

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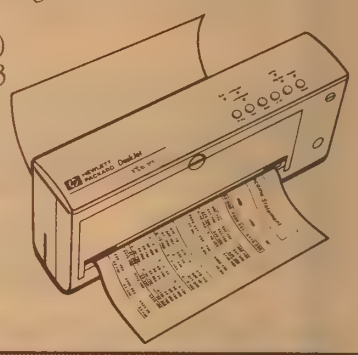

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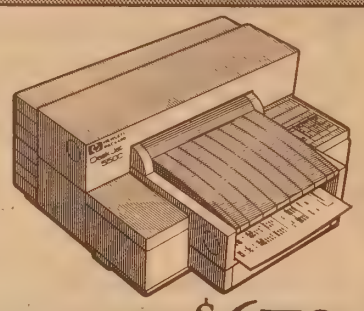

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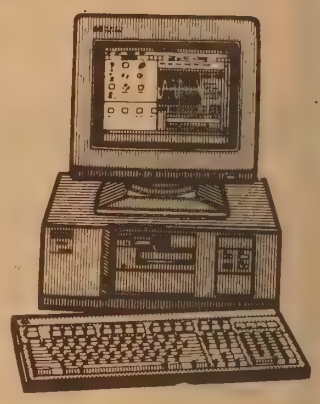

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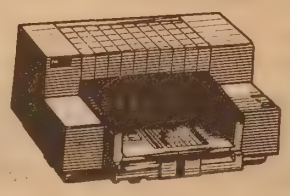

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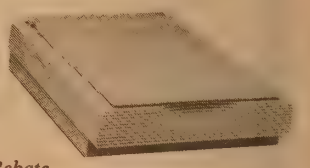

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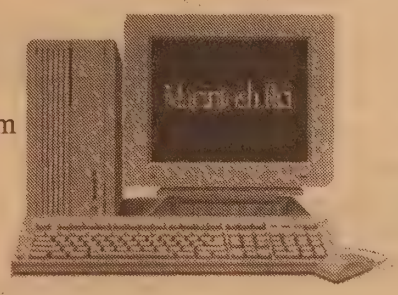

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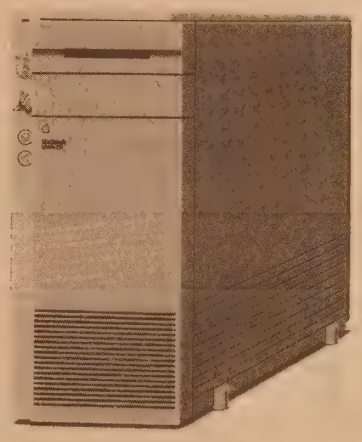

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Continued from page 68

which are in this thing for the long run. You see, that's where the venture capital community cannot support you enough. They're great—

But their timeline is too short.

Yeah. It's just their job. They have investors who are waiting for their return, and they better show it or they don't get the next round. That's their job.

So we have aligned ourselves with people whose timeline is longer, because they also want the market to happen. They'll try to do something to make it happen faster. And that's why we think we can escape the curse of new, innovative technologies, which always take a while to develop.

That was the key to our thinking when we started the company. We saw that it would take a long time. We saw what you say—a lot of companies with great technologies just dying, or being acquired prematurely and really losing the technologies in ways that were just not good. And we think we've created a new model, a model that will allow us to get where we want to be, and be strong when we get there.

You have some units out in beta test right now. Who's using them and what are they being used for?

They are all in large corporate accounts right now, because they have the feature that it's pretty controlled; they give us an opportunity to create seeds for sales, which is what we want, first and foremost. So we identified about thirty so-called advanced customers who span the spectrum from pharmaceutical companies to insurance companies to apparel companies, to more exotic things like a rep company for beauty products. If you look at the industry segmentation, you don't find much commonality. You're hard pressed.

Now if you look at how the units are used and what they do, you find a lot of commonality. They are used by field personnel—sales, marketing, support, customer-oriented people who are outside of the office a lot. And if you asked the companies we worked with why they want this kind of unit, they all have almost the same goal—they are trying to shorten the information cycle for people far away from the office. They are trying to find a way to make these people communicate faster, better, with headquarters, with their suppliers, with their customers. They're trying to get more responsive. They're trying to avoid downtime. They want their employees to be able to be in touch, wherever they are. They are trying to reduce some of the paper overhead for those people in the field. These are the common traits you find in all the applications that we have.

The other common trait is that they are usually successful companies which are aggressive with technology. The reason everybody is talking to the pharmaceutical companies is because it's one of the areas where America is first in the world, totally dominant, the way we were dominant in silicon in the '70s. They are very successful on Wall Street, they're very rich, they're very aggressive, they like technology, and they have the resources just to invest in their people. So they are prime candidates, and they are willing to spend the money now.

> "They want PC connectivity because they want to get the data back and forth, which we do quite elegantly. Few of the customers we've talked to have mentioned that they want to run the same application. They don't like those applications. They're trying to get their users to use the system, and to get that experience of something that's very direct, very simple."

You'll find that all the companies we work with are just on top of their industries. They are the early adopters. They're just very successful in their fields.

At this point their alternatives to using Personal Communicators would be either using notebook computers or using something like GRiDpads. What do Personal Communicators offer that those two alternatives don't?

Obviously they have access to about every possible notebook that you can dream of, and they have concluded that that's not what they want.

When you talk to them, they have a combination of probably three or four factors that come as a whole in their mind. There is the integration/weight/size aspect—we have the pen technology, the RISC technology, all these things make the unit smaller, lighter, faster. That's very attractive. We have a pharmaceutical company where two-thirds of the sales force is women, and they feel that size/weight is a key consideration. They have a lot of problem with notebooks just not being used because people don't want to carry them around.

Another aspect which is mentioned very often is that the tight integration of communication capability turns out to be very key for them. It goes both ways—they are thinking about their users, the simplicity, the ease of use, the natural aspect of the interface; and then they are thinking about their MIS guys who have to configure, who have to buy options, who have to install drivers, and all these things. And they think it's a much better solution for them. The level of software-hardware integration they can get is as good as it gets.

Another aspect that I was surprised about is price/performance. They feel—and I have the math from customers—that what it would take them to get something with notebook technology, which would not be as easy or as integrated, but would do something similar, would be much more expensive. Sure the notebook is $1400 today, or whatever, but the good one they want is $2000. But then you need to add Windows, the drivers, and the modem technology and the email package—if you add what they have to do, they find it to be not only hard but expensive.

The one that comes back at the end of the day is that they feel their users are going to use it more. It's centered around what they want to do, which is essentially send and receive messages—to headquarters, to their customers, to suppliers. Call people. Fax. Take notes. Most of the customers we talked to—not all of them, but a good eight out of ten—are developing a custom app on top. A specific application which is really custom to their own way of working.

Their MIS people are doing that?

That's done in MIS, and very often with VARs. We're learning that there is a VAR community out there of people who love to get those contracts and build applications for large companies.

They feel that the net result is so much better when the guy can be taking an order from a doctor by writing, and have the database of all the doctors he works with, and the history. For the pharmaceutical industry you have a very unique circumstance that I should mention—the legal requirement is to capture the signature from the doctor when he orders. And that definitely does not work on the notebook. So in that specific industry they have a compelling reason, above and beyond anything else, which makes it a very elegant solution for them, because this electronic signature is valid legally. And they can store it electronically the way they want, and they can actually, with the cellular phone attachment we have, send it to headquarters on the spot from the guy's parking lot. That's what they want. That's exactly what they want.

To what extent are you finding that those users need to communicate with conventional computers and computer networks?

To a *great* extent. *[laughs]* We have some demand for Macintosh connectivity, which we don't have in our first product. We have good PC connectivity, and it's used extensively by our customers. They will dial into their file servers and download files, upload files. They will want to have gateways to their corporate mail systems.

Understand now that the sample we have is a very biased sample—it's Fortune 500. Next year we'll have customers like you and me—people who buy them for a group of ten, who buy two—the bottom-up people. We don't have those yet. And so that sample we have is extremely biased toward connecting to the corporate networks. If we did not have PC connectivity, I think we would have lost most of the customers we have today. They would say, "We can't use it!"

Since the Personal Communicator isn't necessarily going to be running the same applications that are on the PC, how does this work?

It turns out that that's not what they want. What they tell us is the reason they want PC connectivity is because they want to get the data back and forth, which we do quite elegantly.

You can go to extremes—you can retrieve a file while waiting for a customer, on a wireless basis. You could connect to your company's PC and get the file. They like that, this shortening-the-information-cycle idea. That's what they're after. Few of the customers we've talked to have mentioned that what they want is to run the same application. They don't *like* those applications. They're trying to get their users to use the system, and to get that experience of something that's very direct, very simple.

I'm sure there are customers who want that, by the way. And we don't have a solution for them. That's not what we're offering. We don't do that. We have a solution for the people who say, "What I want is something very direct to use, very intuitive, that is centered around my communication activities." That's what we've got.

And that's why those people are delighted. Their field personnel are not using much of the PCs they have. They're equipped—you ask them, they have PCs, because they're so inexpensive these days. And if you ask them what they do with it—not much. Do they do many apps? No, they don't. Some of them know 1-2-3 or Excel or Borland's Quattro. They do a few forecasting things with a fixed template that was given to them by the company that they type into. And that's *it.*

They might use the email...

They might use the email, although you'd be amazed, it's not widely used by the field people. At the headquarters, a lot. In the field, those guys never got into how to use that stuff. Not much. But the headquarters people do.

The MIS guys said yeah, it would be great if they used it—and they think that what we have will make them use it, because they can send a handwritten note. They have flexibility in how they do things.

So it's not a big requirement. It doesn't come up. It's not what they're after.

Now if they really want the data to go back to the corporate computer—they want their sales guy to be able to get an updated history of fifty customers in the morning from the corporate database—that level of connectivity is key. And we have it—we can improve it, but we actually have a pretty good setup where you can access a PC remotely from anywhere you are and see it as if it was local, and get files back and forth. And that's a very good start.

The only complaint I've gotten there is that we don't have that for a Mac. And as you'd expect, the people who like Macs—and I'm one of them—are quite adamant about wanting to use that.

Well, Mac people tend to be early adopters anyway, so when anything neat comes along Mac people tend to be at the front of the line going "Where's mine?"

Absolutely. And we're looking at that. It's a reality of the development cycle that we weren't able to provide this specific feature at first customer shipment.

And you're still expecting to start volume shipment in the second quarter?

Yep, we're right on track.

Clearly you've made some technology decisions along the line—for example, you could have gone with Intel or SPARC, but you went with AT&T's Hobbit chip. By the same token, you could have gone with Pen Windows instead of GO's PenPoint—and then, in theory at least, people could have run their spreadsheets and so forth. What was your thinking in making the technology decisions you did?

On the chip side, we knew already that to do communications in a seamless way, to send things in the background while you work, you would need a lot of processing power. Processing power is ease of use, actually. And you didn't get enough. And object-oriented operating systems, which we knew was where the future was, are actually high consumers of CPU cycles.

This is a typical thing—as you move to more sophisticated technologies, you need an order of magnitude more processing. We learned that with the Mac. When we got the 128K Mac we thought it was great. We forgot that it was great for a character-based machine.

So we knew it would take a lot more processing power, and we looked around for technology, and RISC was the way, because it gives you this unique combination of a lot of processing power, and an intrinsically small silicon die, meaning that low cost can be achieved. And because they have few transistors, low power consumption can be achieved.

Which for portables is crucial.

Or you die!

So you look at that and say, "for $20–$30, I'm going to get today the power of a 486, tomorrow the power of a 586, at very low power." You've got to do that, that's the way you're going to win.

It's a risk. It's a big risk. But that's the decision you make trying to go and jump on the next curve. Otherwise you're stuck on the Intel curve with everybody else.

Then the OS decision—that is always a tricky one, and we looked carefully. Now, they're linked, as you probably appreciate—once you've decided "Yeah, I really want to go with RISC technology," you've got to go with an OS that's going to work on a RISC processor. We talked to Microsoft...

Sun's Solaris is a little big for what you're trying to do...

Solaris is great, but a bit heavy for what we're trying to do, and certainly the user interface aspect and everything were less than pleasing from the perspective of a small personal system.

Windows NT sounds great, and would work on the MIPS chips, and on the DEC Alpha. But there's two kinds of RISC processors, really—you have the traditional RISC, which is this desktop idea of "go as fast as you can. Who cares how much power, who cares how much money." And lots of transistors to make it go even faster—they are really powerful. And there is this new idea of RISC as the engine for a portable device, and there aren't many of those. Hobbit was one of the few.

> "Clearly the Communicator could be your perfect window on the information world, the content world. We're looking at both online and store-and-forward services, where you can get delivery of customized news bulletins. We think that we have the great delivery mechanism for them. The machine has this paper metaphor—how much better can it get?"

And so you decide that, and you see that Microsoft won't do anything for Hobbit, and it's hard to convince them, they're very busy...they're doing MIPS and doing DEC and other things. The DEC chip technically is incredible, but that doesn't do what we want.

GO was a unique opportunity, a combination of pretty much the right philosophy for us—communications-oriented, scalable. We're thinking about very small devices, and some pretty big—you can't see and read a fax on a pocket device, and that's not going to change ever. There's limits to scalability, so there is a market for larger devices, no matter what. We have customers who won't take small devices, that's not what they want to do.

They already had that philosophy of how you make things very direct. And we had a chance to convince them to make it move to Hobbit. *[laughs]*

And so when you look at what we were trying to achieve, that was a totally unique opportunity for us, because we could work with them very closely, and it's hard to work with Microsoft very closely, that's clear. They're too entrenched and powerful in where they are.

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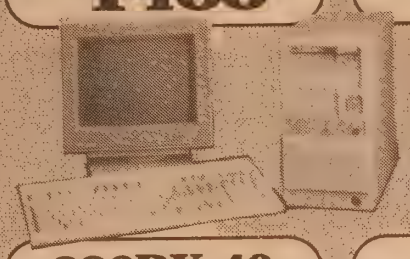

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munications, scalability, ease of use—which we're looking for. So it looked like a pretty good deal—not perfect, Hobbit can be done better, PenPoint is wonderful and it can be better—but compared to our universe, a very good set of technologies for us.

So we took the risk. You do your analysis and you jump. So that's what we did. I'm very pleased with it, because I think the results are going to be great over time. I think it's really going to be an asset of ours two or three years out.

Rather as was done with the Macintosh, the Personal Communicator ships with bundled applications—but in ROM.

Which is a crazy thing to do, but—

Why is it a crazy thing to do? It seems like kind of a no-brainer, you have to do it—the experience of the Macintosh shows you that you have to bundle the applications to showcase the product.

The marketing side *is* a no-brainer. You've got to do it because you've got to showcase the technology. There aren't enough applications for the first *x* months of your life, you've got to give utility out of the box. Something to do when you've bought it.

In our case, we think the Communicators behave somewhat differently from personal computers, in the sense that the users expect it to be pretty complete. It's more like a Sharp Wizard at some level than a PC. They expect it to communicate. It better have email in it—they don't expect to buy that separately. So the basics cannot be options—they become part of the primitives of the system.

The reason I say that's a challenge is technical. Why not put it on a floppy or whatever—because you don't have a floppy always with you. The real way to help the user is to put it in ROM—it can never be lost, cannot be erased, cannot be corrupted, you have nothing to load. It's the perfect thing.

Technically it turns out to be very challenging, because you've got a lot of code to integrate, debug, stabilize, and make work together, and I don't know that anybody ever shipped that much ROM. Any product ever, from any vendor. So we're very proud of it—it turned out to be a good challenge.

How did you decide which products and which vendors to do this with?

That was quite straightforward. We thought—What are the basics? What are the things the customer expects out of the box?

He doesn't expect a spreadsheet out of the box. That's not who those people are. But they expect a calendar. They expect certainly to be able to fax. They certainly expect to be able to keep their to-do list in some form. Those are the basics. So we looked for that, and did a list of what we thought would be the core. We were trying to be critical. We don't want to over-bundle—it's a disincentive to the market and it's not what you want.

So we did that cut, and decided where to get these technologies. This one we can build in-house. This one, there's no way in the time allocated, and it wouldn't even be wise—we'll buy it outside. And so we went and reviewed what was available, worked with all the vendors, who were all GO developers, and did comparisons and all the things you do for those reviews—look at features and the team, whether you like the people, whether you like the product, whether you believe it's going to be the best. And then you go and essentially get to the point where you've made up your mind, and you work with those vendors.

Some of your bundled applications come from Sitka. Sitka being a subsidiary of Sun, do you envision moving into UNIX at any point?

[laughs] I'll be very straight. I don't see it in the cards. I don't see UNIX in our future. I could be wrong. Looking at what we're trying to achieve for our customers, we don't quite see UNIX being part of that world.

> "When I go to the computer shops, we talk about discount structures, all the normal things computer people talk about. When I meet with the Bell company, they're in their world; they want to sell the product because they feel it will help their customers communicate, and it will create traffic on their lines."

UNIX might be running on the server, but...

It will be, very often. But we're on the terminal side, not on the server side.

Do you envision at some point having relationships with online services like CompuServe and AOL?

We think that these are very important things for us to do, and we're working on those right now. Because clearly the Communicator could be your perfect window on the information world, the content world. We're looking at both online and store-and-forward services, where you can get delivery of customized news bulletins.

We think that we have the great delivery mechanism for them. The machine has this paper metaphor—how much better can it get, to deliver information in a custom way to the end-user? I actually believe, if you look beyond personal communication, that this will be the next big thing people will do with these machines. For PCs, it was word processing first and then spreadsheets. My bet is that two years out, there's going to be personal communication and content access.

When you talk about content access, are you talking chiefly about text, or also sound and video and so forth?

Today, it's text. That's where the industry is.

We do compressed sound as a primitive of the system. We have no video capability today, but we are looking at that for future products. Today we're really talking about text in an enhanced form. What we're trying to achieve is to have full use of the visual metaphor—to make text not like a teletype, but like a piece of paper.

What kinds of things are the vertical-market developers doing?

We see so many. A lot of mapping.

GIS?

GIS, but also mapping for salespeople, sales route things. A lot of utilities. We see things with CAD drawings being brought to the field and annotated. We see a lot of graphics, whether it's CAD or mapping-related vertical applications. There's a larger demand for that, and those devices lend themselves very well to it, because of the speed, because of the ability to send and receive those maps in real time.

Even on mapping, there are some horizontal developers who are starting to work on the perfect piece of software for every city in the country, so when you travel, it will have maps and hotels and travel information. It's really a travel guide laid on top of a map.

This is very intriguing to me, because it's a field I'm not so familiar with, and I'm discovering it.

Very few people have heard about it, and all of a sudden we're hearing about it quite a lot.

Exactly, and I'm spending time with those software developers, because, as always is the case, those guys are the precursors, the leading indicators that something will happen.

We had them on the Mac—all these guys tried to do layout things, and we were saying, "What is that, what is that?" "What is 'publishing'? I never heard of it..." So I have this kind of feeling, and I try to spend time with them, to learn more.

As you'd expect, a lot of sales management tools are being built, client record management, sales calls, these kinds of things. Some mainframe-oriented communications tools—not "How do I send a piece of mail to somebody?", or graphics or sound, but "How do I connect to my mainframe and do an SQL query to it?" It's very practical.

We have a guy who works with developers who'd be even more on top of the development than I am.

Do you call him a software evangelist?

Yeah! Why not? I listen to all the lectures on what has to be done. I always find it retrospectively

Continued on page 127

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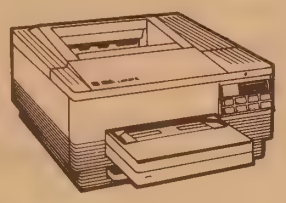

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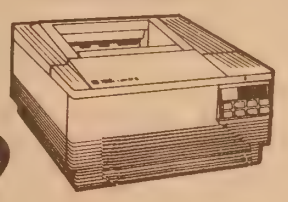

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FailSafe II for Windows provides complete power management software that controls and manages power in a Microsoft Windows environment. It brings to standalone workstations and PCs the power control required to avoid the loss of data in volatile memory in a multitasking environment. FailSafe II for Windows features include automatic and orderly shutdown without the need for manual intervention, continuous real-time monitoring of utility power, real-time configuration for hardware and software operations without reinstalling the software or rebooting the computer, and software controlled preventive maintenance procedures providing increased system life and reliability. ($99) Network Security Systems, Inc., 9401 Waples St., San Diego, CA 92121. 1-800-755-7078.

MICROSOFT MUSICAL INSTRUMENTS CD-ROM

Musical Instruments, the result of an agreement between Microsoft and Dorling Kindersley, offers an interactive environment for users to explore the sights and sounds of more than two hundred musical instruments from around the world. It will extend the richness of the successful Eyewitness Series of Dorling Kindersley books to electronic publishing. The software contains more than two hundred "articles," approximately five hundred high-quality photographs, historical and factual information, and more than fifteen hundred sound samples. Users can easily explore this educational and entertaining product by choosing one of four categories: families of instruments, musical ensembles, A to Z of instruments, and instruments of the world. ($79.95) Microsoft Corp., One Microsoft Way, Redmond, WA 98052-6399. (206)882-8080.

PROFILE

ProFile image database application for Windows gives users the ability to incorporate full-color pictures into a user-defined database application without additional programming. This program empowers users to customize their database for a multitude of applications, such as real estate, security, product inventory, and education, with the added benefit of an accompanying image. Images can be imported directly from a variety of video sources including camcorders, still video cameras,

Continued on page 84

PRODUCT UPDATES

➤**Above Software** has introduced a special edition of **Golden Retriever** for members of computer user groups. The special improved edition is priced at $59, a 40% savings for members of user groups if purchased by February 15, 1993. Above Software, Inc., 2698 White Rd., #200, Irvine, CA 92714. 1-800-344-0116.

➤**Aldus** announced a free **accessory pack** for **Aldus PhotoStyler** that includes full support for **Eastman Kodak's Photo CD** technology. Aldus Corp., 411 First Ave. S., Seattle, WA 98104-2871. (206)622-5500.

➤**Autodesk's** Multimedia Division released **Autodesk Animator Pro 1.3**, the upgrade to its 2-D paint and animation software package. Animator Pro 1.0 owners can upgrade for $199. Autodesk, Inc., 1-800-525-2763.

➤**Avantos Performance Systems** released **ManagePro for Windows v1.2**. Avantos Performance Systems, Inc., 5900 Hollis St., Suite C, Emeryville, CA 94608. 1-800-282-6867.

➤**Cadkey** announced a series of new **CADKEY bundles and prices and a trade-up offer**. Cadkey, Inc., 4 Griffin Rd. N., Windsor, CT 06095-1511. (203)298-8888.

➤**MapInfo** introduced **StreetInfo v2.0**, a new data file for street-level maps of the US that are attractive, easy-to-use, and rich in geographic detail. MapInfo Corp., 200 Broadway, Troy, NY 12180. 1-800-327-8627.

➤**Santron Computer** announced a new, comprehensive **VIP Customer Service** program. This program is designed to provide a new level of customer service to corporations, government and military organizations, educational institutions, exporters, and resellers. Santron Computer, Inc., 1185 Chess Dr., Suite 1, Foster City, CA 94404. 1-800-748-6355.

➤**Shiva** is bundling **Magnet**, from **No Hands Software**, with its **LanRover/E for AppleTalk Remote Access**. Shiva Corp., One Cambridge Center, Cambridge, MA 02142. 1-800-458-3550.

➤**WordPerfect** is shipping **WordPerfect Presentations 2.0 for DOS**. All retail packages of WordPerfect Presentations will be bundled with **PC-Kwik**, a disk caching program that enhances product performance. WordPerfect Corp., 1555 N. Technology Way, Orem, UT 84057. 1-800-225-5000.

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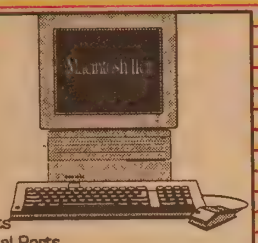

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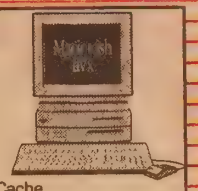

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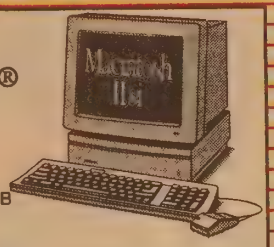

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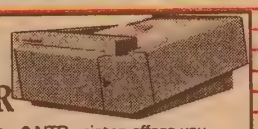

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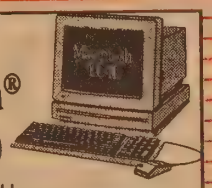

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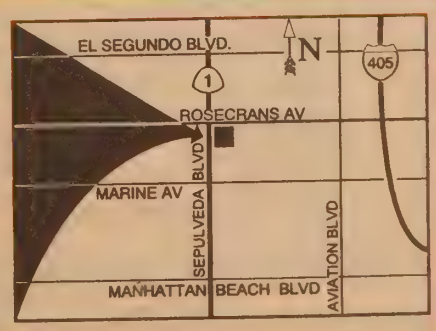

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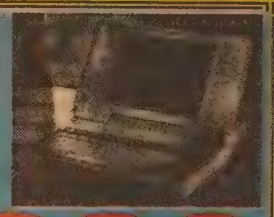

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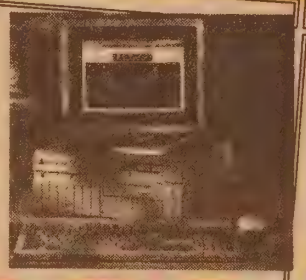

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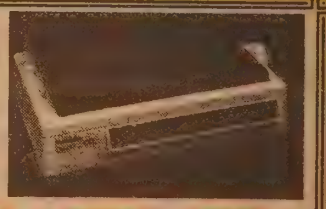

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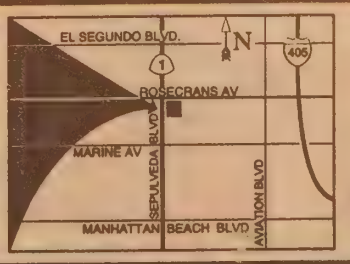

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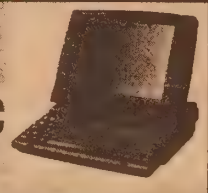

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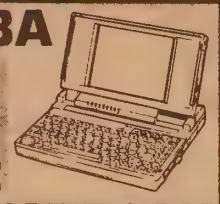

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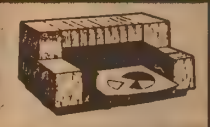

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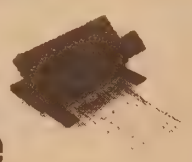

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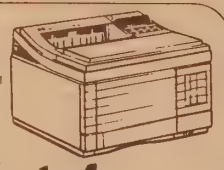

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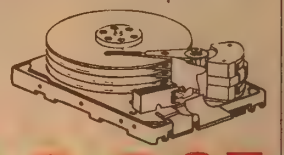

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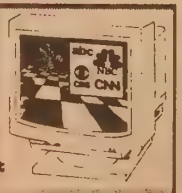

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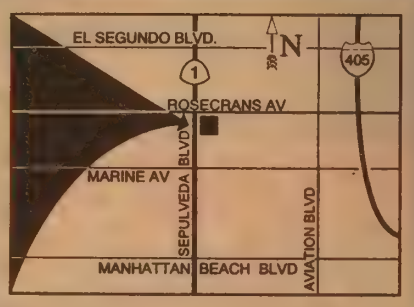

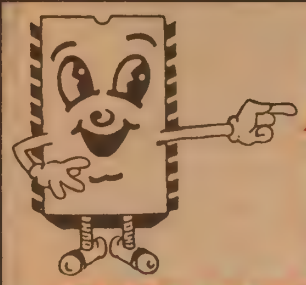

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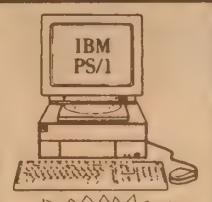

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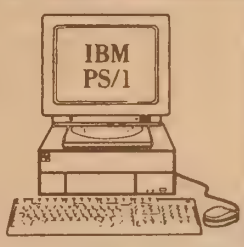

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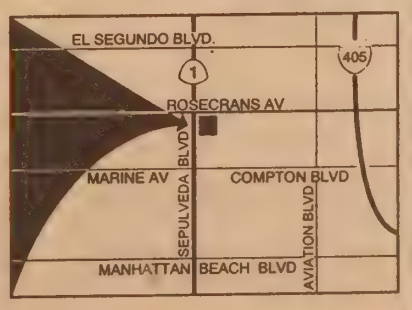

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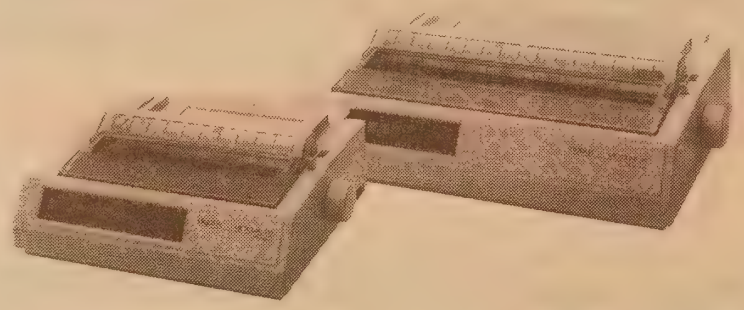

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Continued from page 78

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DISPLAYS

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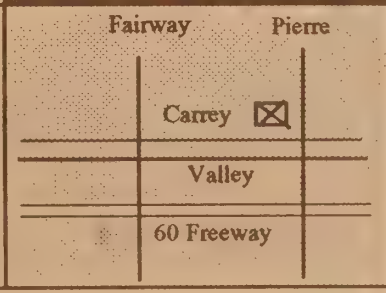

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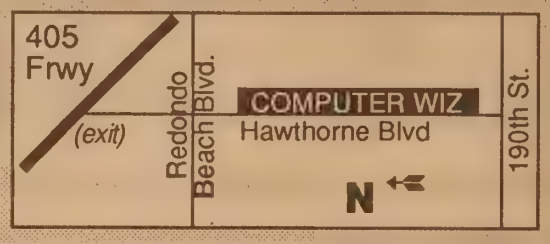

PRODUCT SPOTLIGHT

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REVIEWS

GAME REVIEWS

By Mike Markowitz

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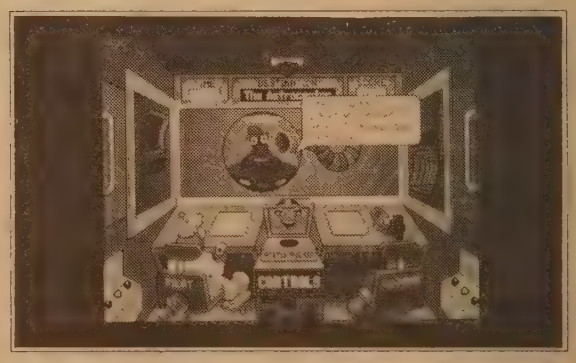

rescue with their Dinosaur Delivery Service. Your job is to help them figure out clues that indicate which planet gets the next hot meal. Clues consist of facts about the planet. For example, "Three-quarters of their planet's surface is ocean," would tip you off to Earth as your destination.

Your base of operations is the Astrocenter, where you can pick up food, obtain clues, and park your

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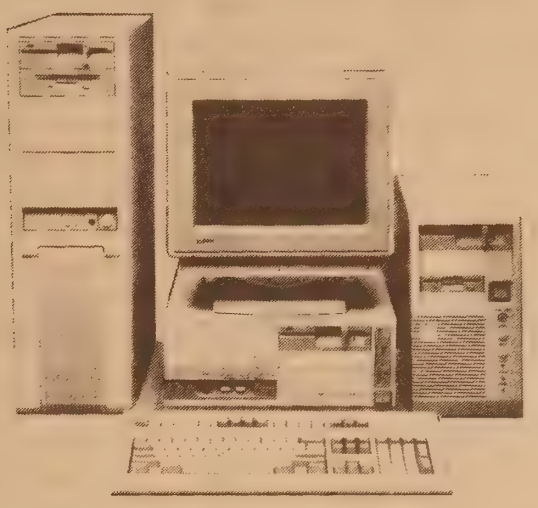

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spacecraft in the garage to save a game. While traveling you encounter hazards like hyperspace traffic jams, Space Cops, and fierce competition from Mr. Bronto's greasy Bronto Burgers. Some of the animated special effects (traveling through hyperspace or moving between sections of your space station) are spectacular.

You can run the program using synthesized speech, text balloons, or both. First Byte's patented text-to-speech technology delivers a robotic voice even on systems without an audio card, though the sound volume is quite low. There are multiple levels of difficulty, but the user interface is quite simple. Zug's Race Through Space is designed for ages 5–12. The autopilot in your spacecraft has an endless supply of knock-knock jokes, which still appeal to this age group.

The program is installed from five 3.5" disks, and takes up about 5MB of hard disk space, due to the extensive sound and graphics files. For each planet there is a full-screen, high-resolution digitized photo, such as the spectacular Voyager images of Jupiter and Saturn. A 28-page user manual provides the background for the story line and clear instructions.

Our only criticism of Zug's Race Through Space is that the content is too thin. There are only eleven possible destinations: nine planets, plus the sun and the asteroid belt. This is not enough variety to maintain interest over many playings. It's a big universe, and with hyperspatial drive you should be able to visit some of those stars, nebulae, and galaxies that we can rarely see anymore in the urban night sky. (First Byte, PO Box 2961, Torrance, CA 90509. 1-800-556-6141)

Graphics and Animation: 9
Sound: 9
User Interface: 8
Overall Value: 7

SPACE ADVENTURE

Designed By: Bill Gross
Published By: Knowledge Adventure
For: MS-DOS (640 K, VGA or SVGA graphics, mouse and audio card recommended)
List Price: $79.95

The programmers at Knowledge Adventure have been pushing the state of the art in file compression for high-resolution color imagery, making it possible to store a lot of photo-realistic pictures on your hard disk and display them almost instantly. This neat trick is built into a hypermedia "engine" that lets you move around in time and space with graphics, text, and sound to explore connections between people, facts, and events. They call it "multimedia without a CD-ROM."

With Space Adventure they have taken a giant leap for Mankind by developing a proprietary technology for compressing full-motion video. The program includes seven video clips—100MB of data!—scrunched down to about 1.2 MB. The results are slightly grainy and a bit jerky (at ten frames per second), but they compare very favorably with Apple's QuickTime movie technology seen on a Macintosh.

Space Adventure consists of over three hundred screens that document the history of astronomy, space exploration, rocketry, and related topics. Much of the text was written by Tom McDonough, a lecturer at Cal Tech. Astronaut Buzz Aldrin helped review the material on the US space program.

Each screen consists of a graphic window (about a quarter of the screen), a scrolling text window, a time line indicator, and a wonderful globe that highlights the location of the event. You can rotate the globe, zoom in or out, or expand it to a full screen. Click anywhere on the globe and the program jumps to the nearest event. There are well-designed on-screen buttons for every function and category of information. There are also pop-up explanations of details in many of the graphics (similar to Balloon Help on the Mac). For example, in a group picture of several astronomers, you can point to an individual and a pop-up balloon will identify the person.

The program is installed from compressed files on five high-density disks. While you're waiting, the installer displays a series of informative screens describing the features of the program. After installation, Space Adventure occupies about 8MB of hard disk space. On-screen help is so comprehensive that most users will never need to open the slim *User Manual*.

Space Adventure is the fourth package in a series; the others are Knowledge Adventure, Sports Adventure, and Science Adventure. Future titles will include Dinosaur Adventure. The programs have a common "engine" but each is a standalone application. The engine is a surprisingly compact 150K executable. An authoring program that will allow users to create their own screens is under development.

Graphics and Animation: 9
Sound: 9
User Interface: 9
Overall Value: 9

Anyone who wants to see excellence in the design and implementation of educational hypermedia should check out Space Adventure. (Knowledge Adventure, Inc., 4502 Dyer St., La Crescenta, CA 91214. 818/542-4200)

DARKLANDS

Designed By: Arnold Hendrick
Published By: MicroProse
For: MS-DOS (640K, VGA graphics, mouse and audio card recommended)
List Price: $69.95

Darklands is an ambitious attempt to make a fantasy role-playing adventure "realistic." Instead of the usual homogenized alternate reality cribbed from J.R.R. Tolkien, the game is set in Central Europe during the fifteenth century. The designer has tried to present the fifteenth century world as people of that era experienced it, with folklore and popular superstition a part of "reality."

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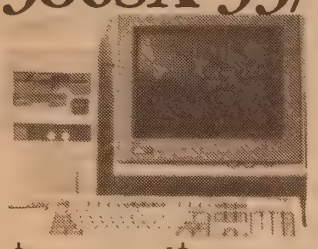

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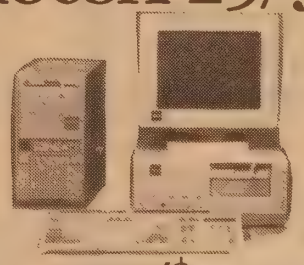

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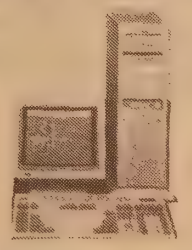

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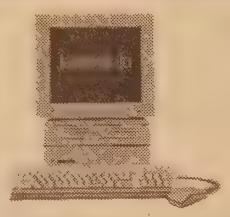

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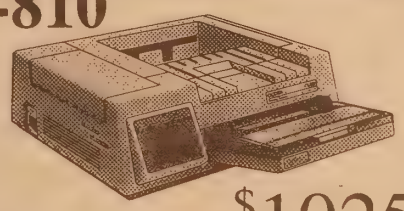

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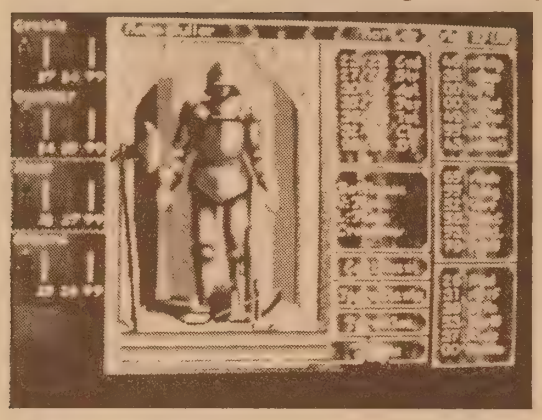
open-ended adventure; there is no single objective or puzzle to solve. The elaborate character-generation system creates unique individuals with a variety of strengths and weaknesses.



The game map covers Germany and surrounding areas north of the Alps, from the Netherlands to Poland, including major towns, castles, and trade routes. You move across the map by simply pointing to a destination, and the program works out the route. Given the poor state of the roads, travel by water is often the best option, but you risk encountering river pirates.

Each city has a variety of locations where you can lodge, seek information, go shopping, or get into trouble.

Combat is a basic feature of the game. Every imaginable weapon, from crossbow to halberd is modeled in the game; including crude early handguns (but not the Holy Hand-Grenade of Antioch). Better weapons and armor are extremely expensive. A major source of income is selling the equipment of defeated foes. Characters are rated according to their strength, endurance, agility, and skill with each weapon category. When you tangle with bad guys, you must decide where each character will stand and which enemy he will fight; the program then displays a blocky, low-resolution animation of the battle, flashing numbers to indicate the severity of each wound.

Graphics and Animation: 7
Sound: 7
User Interface: 7
Overall Value: 7

Alchemy and religion are major sources of power in Darklands. If you have the skill and can collect the esoteric ingredients and formulas, you can mix up anything from a simple stink-bomb to a powerful healing potion. You can pray to over one hundred saints, with their proper attributes and feast days. If you have accumulated enough merit, bagged a powerful holy relic, or donated generously to the right monastery, prayers may actually work miracles. The designer's notes emphasize that the corrupt medieval Church represented in the game bears no resemblance to today's Roman Catholic Church. He also includes a diplomatic disclaimer: "The region depicted in the game, Greater Germany, is not intended to be a justification for German expansion into neighboring countries."

A variety of musical themes set the tone for each scene, and there are lots of combat sound effects.

Darklands is a huge program: about 17MB after installation from eleven high-density disks. A long, melodramatic, and rather unnecessary opening animated sequence contributes to this extravagant demand for storage space.

The 104-page manual is attractively designed, well indexed, and includes a good bibliography. There is also a quick reference card and a colorful reference map.

Most of the artwork in the game is excellent, but it loses points for the jaggy combat animation. Although the menu-based interface is fairly clean, some of the character status and inventory displays are confusing. Darklands should appeal to a wider audience than most fantasy role-playing games. Medieval history buffs (like those guys in home-made armor you see at the Renaissance Fairs bashing each other with sticks) will love it. (MicroProse, Inc., 180 Lakefront Dr., Hunt Valley, MD 21030. 410/771-1151)

PC SOFTWARE REVIEWS

PC-SIG LIBRARY CD-ROM 11TH EDITION

Published By: PC-SIG
List Price: $179
Reviewed By: Matthew Leeds

Shareware has always been a rich source of programs and clip-art. Finding the best shareware, including documentation, has been more of an art than a science. PC-SIG has collected over 800MB of the best shareware, stored most of it in compressed form, included a hypertext index, and checked each program for viruses. It's all available on this latest edition of the CD-ROM.

While the list price for this CD-based collection may be high for some users, shareware is an excellent alternative for small businesses staring at thousands of dollars in startup costs to purchase software as they computerize. Shareware fees are typically 10%–30% of commercial software, and having the original distribution on CD insures that the master disk is never infected or over-written.

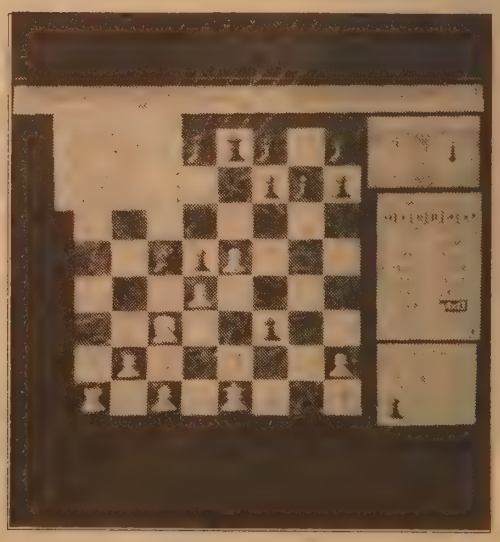
The hypertext index supports both keyboard and mouse interfaces. Screen dumps of many programs are available to allow inspection of the user interface without the bother of running a program. Decompression and copying is handled automatically by the index program. The index is easy to navigate and straightforward to use. (PC-SIG, Inc., 1030-D E. Duane Ave., Sunnyvale, CA 94086. 408/730-9616)

CHESSMASTER 3000—MULTIMEDIA WINDOWS VERSION

Published By: The Software Toolworks
List Price: $59.95
Reviewed By: Woody Liswood

If you like to play chess, you will like Chessmaster 3000 CD-ROM. It offers a good game of chess with graphics, has stored games for you to explore, and generally, is fun to use.

Chessmaster 3000 presents you with a variety of options. You can play against the



computer or human opponents. You can also set up a specific problem to solve, or get one

Continued on page 102

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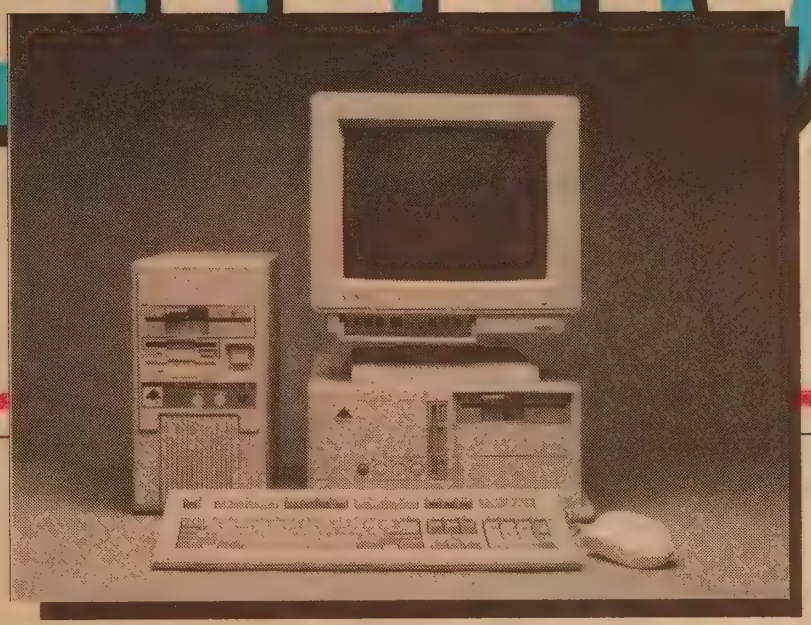

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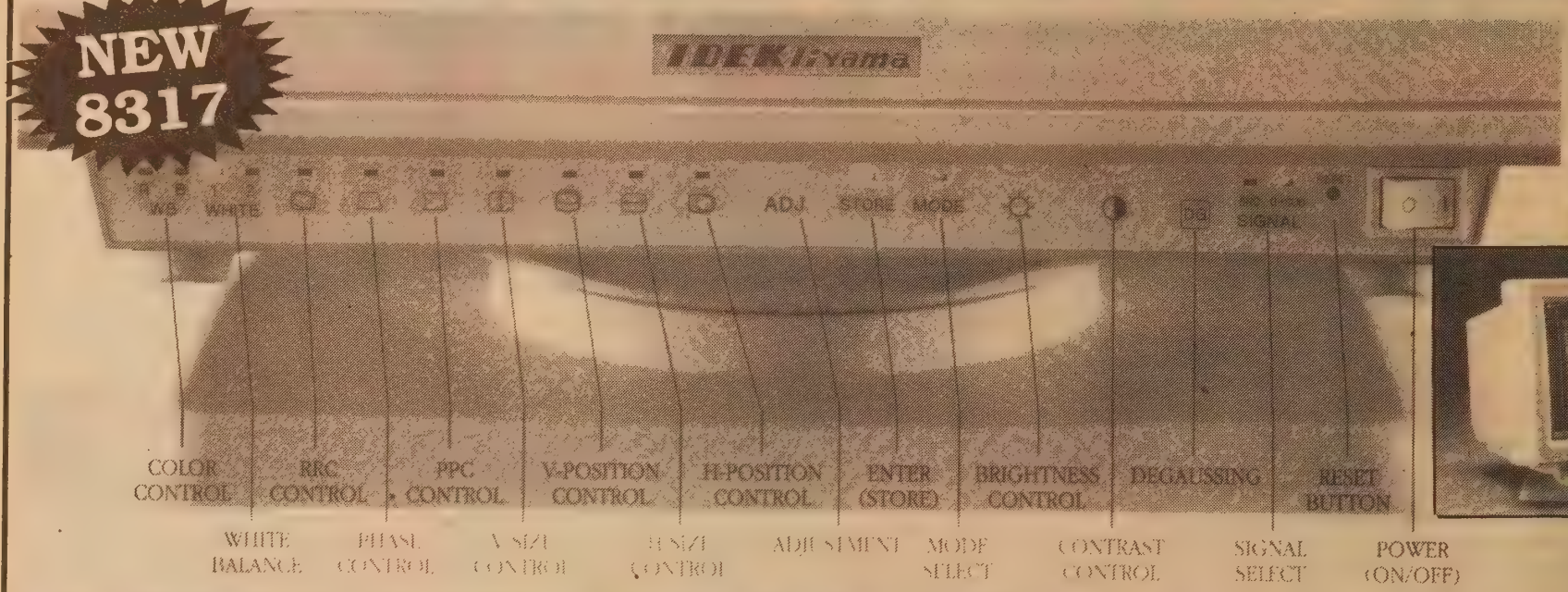

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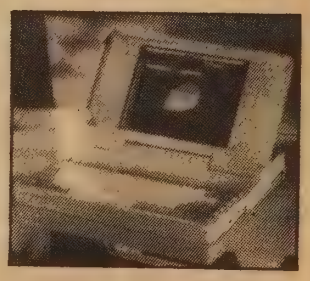

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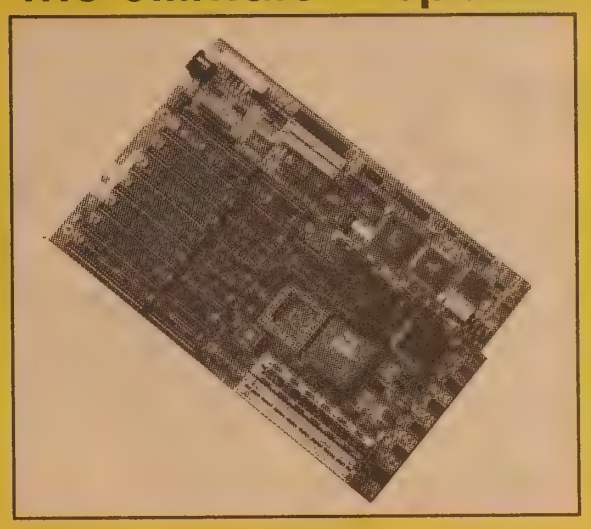

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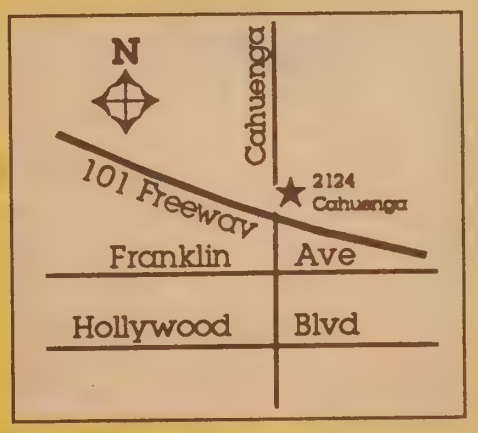

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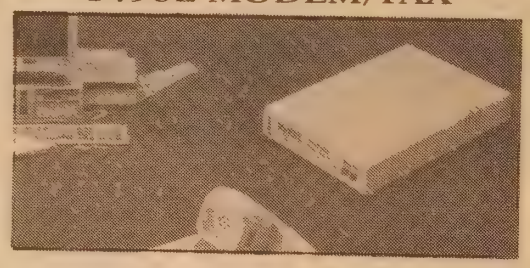

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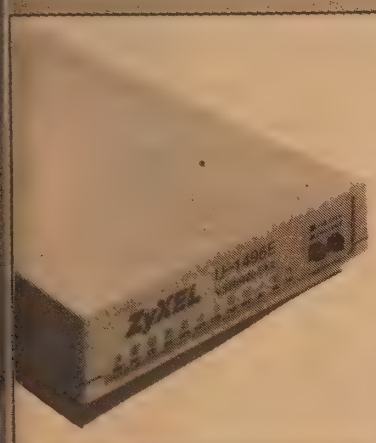

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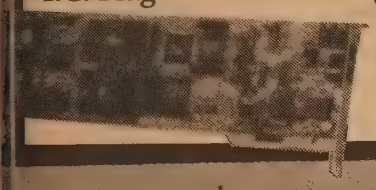

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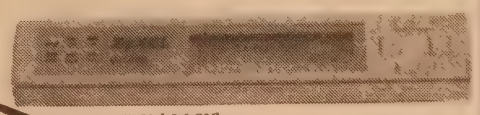
U-1496



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Window Work Group	Call

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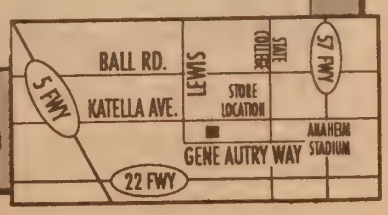


PRODUCT SPOTLIGHT

Continued from page 94

from its library, asking for help at any time. Your move history can be saved to an ASCII file. Other options let you change the board set or the board itself at any time, use 2-D or 3-D images, rotate the board for a different view, turn on or off the sound, and save or restore games. If you play tournaments, you can set up your own round-robin with up to ten players creating any combination between the computer and people.

Multimedia makes everything in Chessmaster 3000 better. You can now hear as well as read about the classic games. The Mentor Program speaks to you and tells you about a suggested move or what it is contemplating as a move. A Personal Guide actually talks you through a game, and Help talks to you. As you play, the extensive help system can give you illustrated advice on legal moves and highlight pieces that might be threatened.

I can't really tell you how good a chess player Chessmaster 3000 is. It played well. Sometimes it beat me, sometimes I won. But I did not try it at any advanced level. If you want to be rated, Chessmaster provides you with a rating. And, if you like a specific type of chess notation, Chessmaster offers coordinate, algebraic, English, International, or long algebraic notations.

If you like a chess opponent who plays music and talks to you about your move, gives you verbal advice, if warranted, and has a variety of graphic chess pieces and boards, then you will really like Chessmaster 3000.

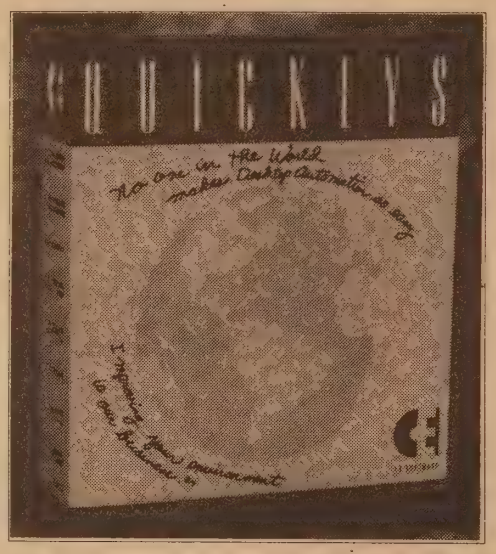
Although Chessmaster is available in a multi-disk MS-DOS version, I prefer the convenience and added goodies of CD-ROMs. This CD-ROM based multimedia software is where the entire industry is heading. I like it! (The Software Toolworks, Inc., 60 Leveroni Court, Novato, CA 94949. 415/883-3000)

MACINTOSH SOFTWARE REVIEWS

QUICKEYS 2.1

Published By: CE Software
List Price: $149
Reviewed By: Matthew Leeds

Computer users are creatures of habit. We do the same things over and over again: cutting and pasting addresses from a phonebook program to a letter, running three different Photoshop filters on an image, or remembering to run a backup of our data files. Computers were supposed to free us



from repetitive tasks, and instead they seem to have exponentially expanded them.

Enter QuicKeys, the macro program from CE Software. QuicKeys can watch what you do and remember it, then repeat it. You can teach it to do just about anything. The macros you create can be edited and modified if needed. Macros can be assigned to hotkeys or as menu items.

This latest version of QuicKeys is System 7 savvy. It understands aliases, has balloon help, lets you cycle through open applications, handles Apple Events, lets you add comments to your macros, and is 32-bit clean. It also provides extensions to Apple Events that let you send Apple Events to other Macs on a network and to the Finder. It can also communicate with UserLand IAC aware applications like Frontier. No power user should be without it. (CE Software, Inc., 1801 Industrial Circle, PO Box 65580, West Des Moines, IA 50265. 515/224-1995)

GRACELAN ASSET MANAGER

Published By: TechWorks
List Price: $895
Reviewed By: Matthew Leeds

In my day job I work for a major software publishing company. Part of my responsibility there is managing the corporate network of several hundred computers and several hundred computer users. Keeping track of their systems, the software installed on them, the memory and hard drive sizes, the versions of operating systems they use, and all of the other details sometimes seems unimportant. At least until you have to solve a problem for them, or decide on how many upgrades to purchase for a particular application used in the company, or report on just where the last three new computers purchased were installed.

Asset Manager is a relational database built on 4th Dimension. It uses information collected by TechWork's Network Manager to profile and inventory the hardware and software installed on a Macintosh network. You still need to enter additional information such as serial numbers, purchase price, etc., if you want to track it.

Once you've collected the required data you can pull up information on any system, check the hardware configuration, see what version of software a person is using, track depreciation on hardware and software investments, and print out reports on any or all of this info.

Asset Manager makes it easier to keep track of what's been bought, installed, and added to the ever-growing collection of hardware and software at our company. It provides a central point of information and offers a framework for managing data. You'll still need to spend a lot of time keeping it up-to-date, and currently it has no interface to any of the DOS programs that collect similar information over the network (this is essential in a mixed hardware environment). (TechWorks Inc., 4030 Braker Ln. W., Ste. 350, Austin, TX 78759. 1-800-688-7466)

PROART PROFESSIONAL ART LIBRARY PORTFOLIO CD-ROM

Published By: Multi-Ad Services
List Price: $595
Reviewed By: Matthew Leeds

The ProArt Professional Art Library Portfolio

Continued on page 140

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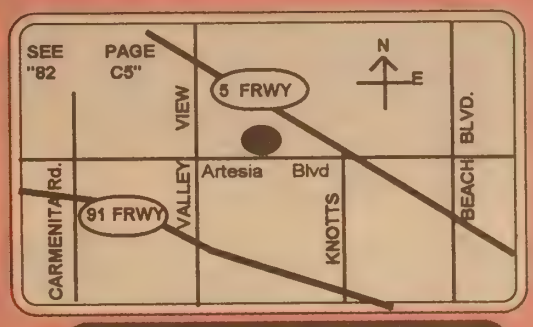

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* Floppy / Hard Disk Controller
* 2 Serial / 1 Parallel / 1 Games
* **TEAC 1.2 & 1.44** MB Floppy Drive

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*** All advertised price reflect 2% cash discount ***

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- 101 ENHANCED KEYBOARD

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- 14" 1024 x 768 0.28 DOT SVGA MONITOR
- 101 ENHANCED KEYBOARD

SALE PRICE: $1150

CASH DISCOUNT: **$1095**

386DX-40MHz

- 128K CACHE RAM
- 4MB RAM UP TO 32MB RAM ON BOARD
- 1.2MB & 1.44MB FLOPPY DRIVE
- 125MB HD, 17MS (BUILT-IN 32K CACHE)
- DUAL IDE FD/HD CONTROLLER
- AT I/O: 2 SERIAL/1 PARALLEL/1 GAME
- 16 BIT SUPER VGA CARD W/1MB RAM
- 14" 1024 x 768 0.28 DOT SVGA MONITOR
- 101 ENHANCED KEYBOARD

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- 4MB RAM UP TO 32 MB RAM ON BOARD
- 1.2MB & 1.44MB FLOPPY DRIVE
- DUAL IDE FD/HD CONTROLLER CARD
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- 101 KEYBOARD
- 170 MB HD, 13MS
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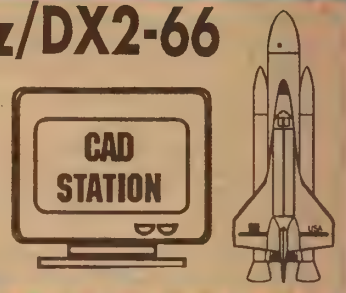
- 15" 1280 x 1024 SVGA MONITOR, FLAT SCREEN



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- INTEL 80486 PROCESSOR WITH BUILT-IN MATH
- 256K CACHE RAM
- 4MB RAM UP TO 32MB RAM ON BOARD
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- DUAL FD/HD CONTROLLER CARD
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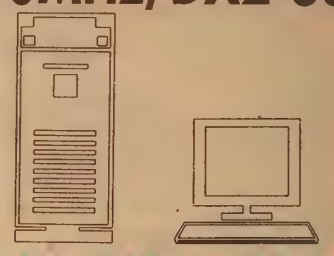

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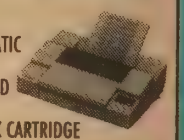

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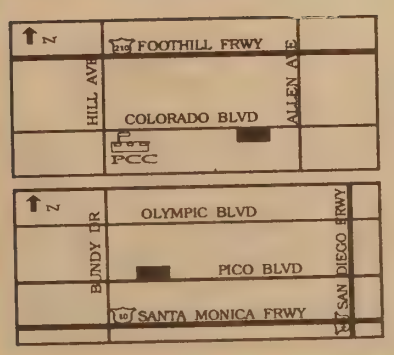

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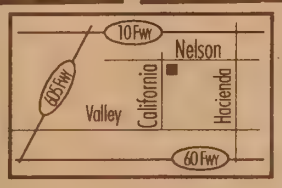

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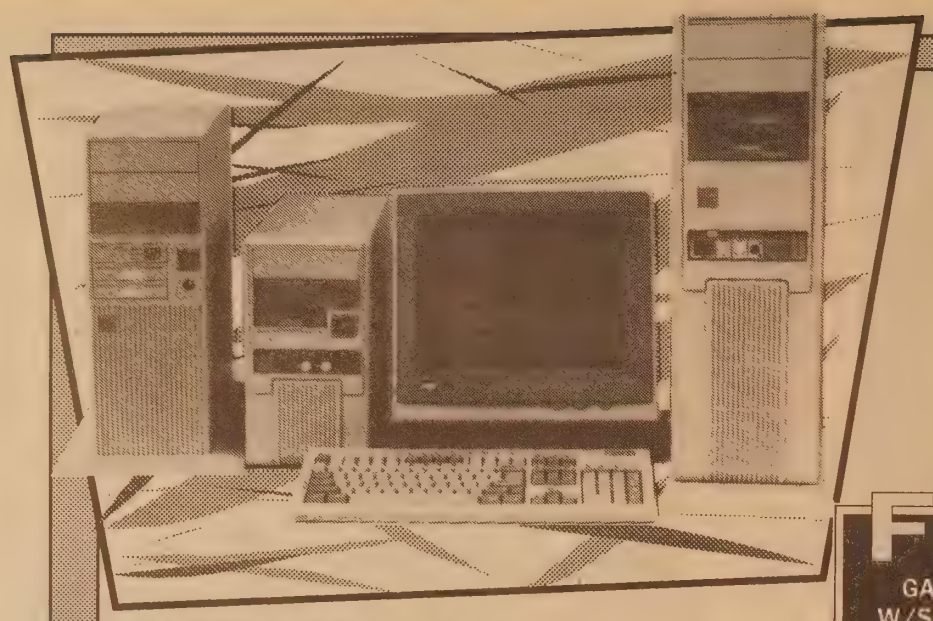

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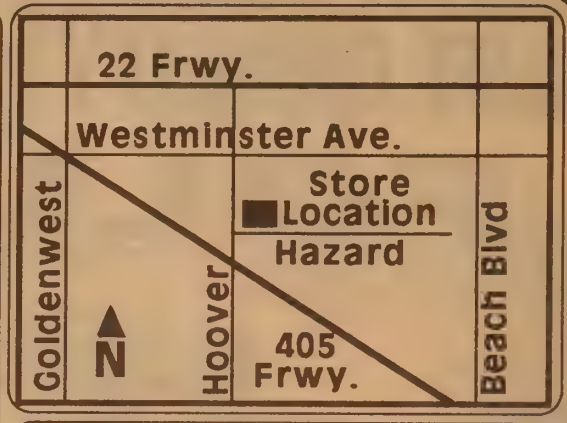

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For the past few years, television ads, movies, and music videos have incorporated a special effect called "morphing." You've probably seen the car commercial which shows the prior year's model magically stretch and bend to transform into the new model. *Terminator II* also made extensive use of this effect. Of course all of these morphs were accomplished using expensive, high-end graphics workstations, but this power is now available on the Amiga.

Essentially, the process of setting up a morph involves linking points on one picture to points on another, to identify related areas of the pictures. Over a series of generated frames, the source areas are transformed into the shape of the target areas with the colors being cross-dissolved. The simplest morphing involves just two pictures; however, full-motion morphs, where the source and target are sequences of images, can also be accomplished. Recently, two new morphing programs have been introduced by ASDG and GVP.

MORPHPLUS

ASDG's product consists of several programs. For morphing you'll use two of them: Morph, which handles the morphing details, and MorphPlus, which actually performs the image processing.

Morph uses an onion-skin approach where images are displayed in grayscale on top of one another in high or low resolution. Using a slider gadget, you can adjust the amount that each image shows through. The display images are scaled to fit the edit window; however, internally, the images still retain their original color palette and size.

Vectors are used to set the source and target points. These are nothing more than lines that begin on the source image and end on the target image. Vectors can be linked together to produce edges that surround an important feature, like an eye for example. Edges allow you to minimize the number of required vectors. This is a simple point-and-click procedure. To reposition a vector, you can move the entire vector or drag either end individually. Vector position data can also be input numerically for extreme precision.

The simplest morphing involves just two pictures; however, a-motion morphs, where the source and target are sequences of images, can also be accomplished.

With vectors appearing all over the screen, things can get a little confusing. Fortunately, Morph provides many features to aid in vector placement. You can, for instance, turn off the source points and display only the target points, or vice versa. If very precise vector work is required, a zoom feature is provided to enlarge any part of an image.

To simplify the vector editing process, you can group vectors and assign descriptive names to them like "left eye." This allows you to perform certain operations on logical groupings of vectors rather than having to work with each one individually. For example, groups can be quickly made invisible or visible. You can also cut and paste a group or delete it entirely.

Groups can also be given their own motion and transparency attributes. Motion controls the movement from the start to end points of each vector. Transparency is the amount of source image mixed with the destination image. These controls allow you to do things like morphing the left eye faster than the right.

A time-line graph is used to adjust these two settings. The default for both of these is a straight line. That is, motion and transparency change evenly over time. By adding points anywhere along the line and moving them, you can bend the line to change the motion and transparency timing. The method of connecting the points can be linear, which uses a straight line, or spline-based, which smoothes out the curve. As with vectors, each time line point can be set numerically for very precise settings.

Groups can also be used to generate a quick preview of the morph. By selecting some or all of the groups, you can get a real-time preview of the motion of your vectors. This can expose inconsistencies early on before you actually render the final morph, which may save you a considerable amount of time.

To actually execute the morph, both Morph and MorphPlus must be running at the same time. This is very memory intensive; even with 5MB of free RAM on my A3000, I was barely able to work with two 24-bit images. Time and memory can be saved by selecting "fast precision" for output, though some quality will be sacrificed.

The MorphPlus program has many of the

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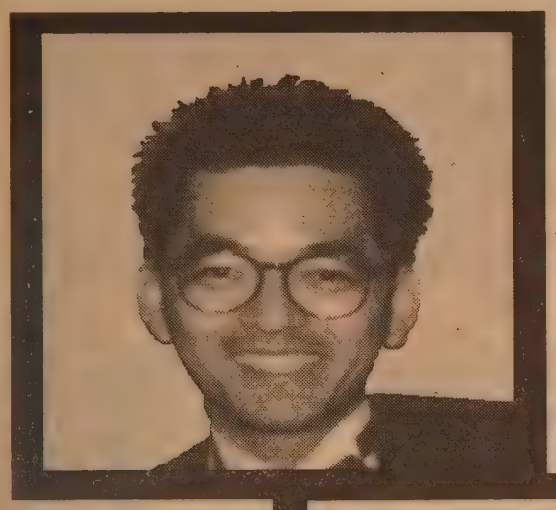
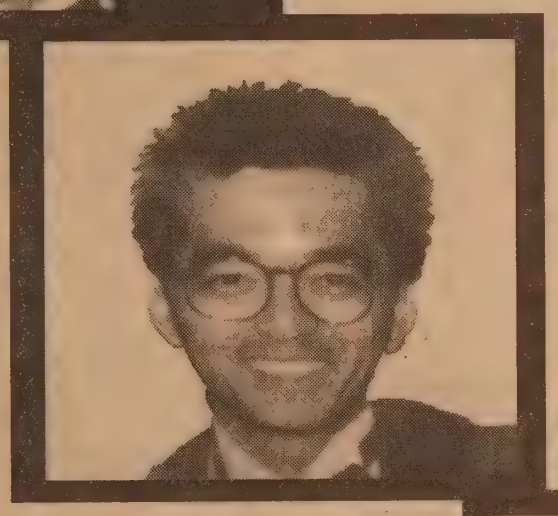


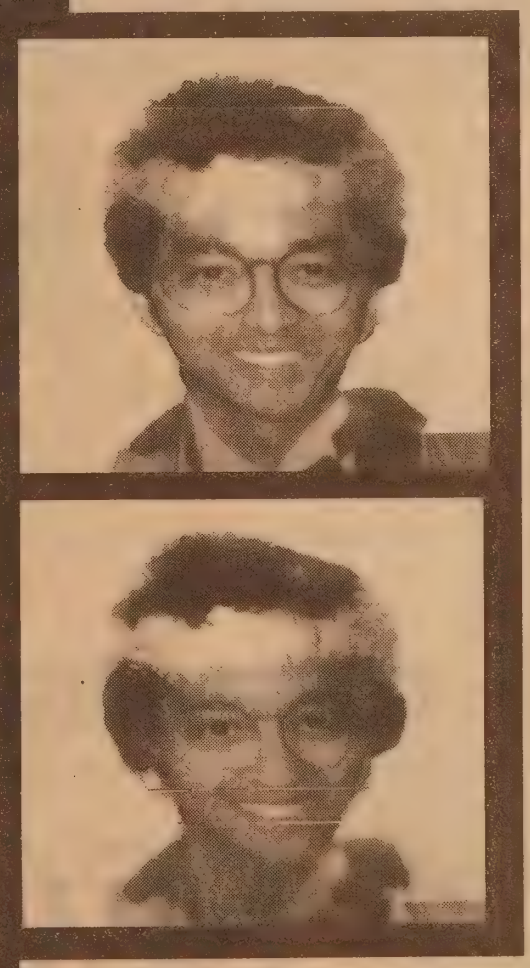


Doug and Monique Nakakihara, and some in-between beings.

image processing features of Art Department Professional (AD Pro) plus some new ones, such as blur, perspective, refraction, ripple, rotate, sphere, and twirl. In fact, it is really a stripped-down version of AD Pro with added operators. Moreover, if you already have AD Pro, you can install the new operators and use AD Pro in place of the MorphPlus program.

MorphPlus includes anim, IFF, and JPEG file loaders and savers. HAM-E files can also be saved. If AD Pro is used, you'll have even more loaders and savers. Additionally, using the "Pre-save ARexx Hook" feature, it was a fairly easy task to write an ARexx script to convert an output image to DCTV format before it was saved.

The total MorphPlus package is a massive and complex product which goes far beyond morphing. Fortunately, it comes with a thick, three-ring binder manual. I found the owl and baby tutorial images a little skimpy, however. I think better sample images could have been supplied. I would have also liked sample images for a full-motion morph.



CINEMORPH

GVP's CineMorph (v1.02) is a standalone program that differs substantially in approach from MorphPlus. Initially, the images are set side by side, but you can resize an image's window by simply grabbing the window's corner. The images are displayed using four or eight shades of gray; however, internally they maintain their full color palette. The zoom feature lets you enlarge an image within a window and the arrow keys can be used to pan around the image.

A fishnet-like grid or mesh is placed over the images. At the intersection of each horizontal and vertical line is a point. You must drag these points to essentially outline the contours of the images. You can also easily move selected points, or entire rows or columns if you wish. Each image has the exact same number of points, though each point can be placed in different positions on each image. Additional rows or columns of lines can be added if the need for greater precision arises. Points can also be grouped and named, for quick reselection at a later time. You cannot, however, change the visibility of points.

The mesh can either be displayed as lines or splines. Either method can also be used in the actual morph operation. A spline is a type of bezier curve commonly used in structured drawing programs. Splines are much more difficult to control but are more accurate. Though the display method need not match the morphing output method, results are more predictable if they do. For the most part, the line mode works fine for both and is much easier. To smooth out jaggies, an anti-alias output option is also featured.

CineMorph also has the ability to set the overall tweening and dissolve curves. These are similar to MorphPlus's motion and transparency time line graphs, respectively. Some standard curves can be used or you can manipulate the existing curve any way you desire. Tweening and dissolve can also be set for individual points. For debugging, CineMorph includes a test output mode which overlays the source and target mesh in different colors.

CineMorph outputs directly to HAM-E, DCTV, IFF24, and standard Amiga image formats, including the new AGA display modes. You can save the output as individual images or have an anim file built automatically. The anim can also be made to "ping-pong" where it plays forward then reverses. However, ping-pong anim files will be twice as big, and it will take twice as long to finish, since it re-renders the frames in reverse order instead of using the frames already rendered. If you don't want to use the size of the original images, the output size can be set manually; however, this may distort the output images' aspect ratio.

CineMorph comes with a booklet-type manual but includes on-line help using Commodore's AmigaGuide hypertext program. As with MorphPlus, I would have liked to have seen a tutorial on full-motion morphing.

If you purchase CineMorph, make sure you get the latest version. GVP has added many new features since its initial release. CineMorph is actually a subset of GVP's brand new image processing program, with ImageFX. This appears to be GVP's answer to AD Pro. Its impressive list of features includes image processing, format conversions, special effects, etc. Utilizing the version of CineMorph that comes with ImageFX, you can access some special options, like loading, rendering, and saving using a multitude of file formats. You can also have ImageFX execute image processing commands on CineMorph's output.

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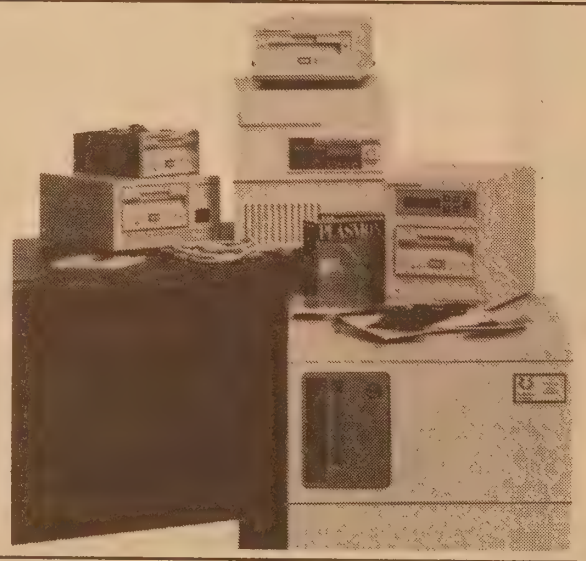

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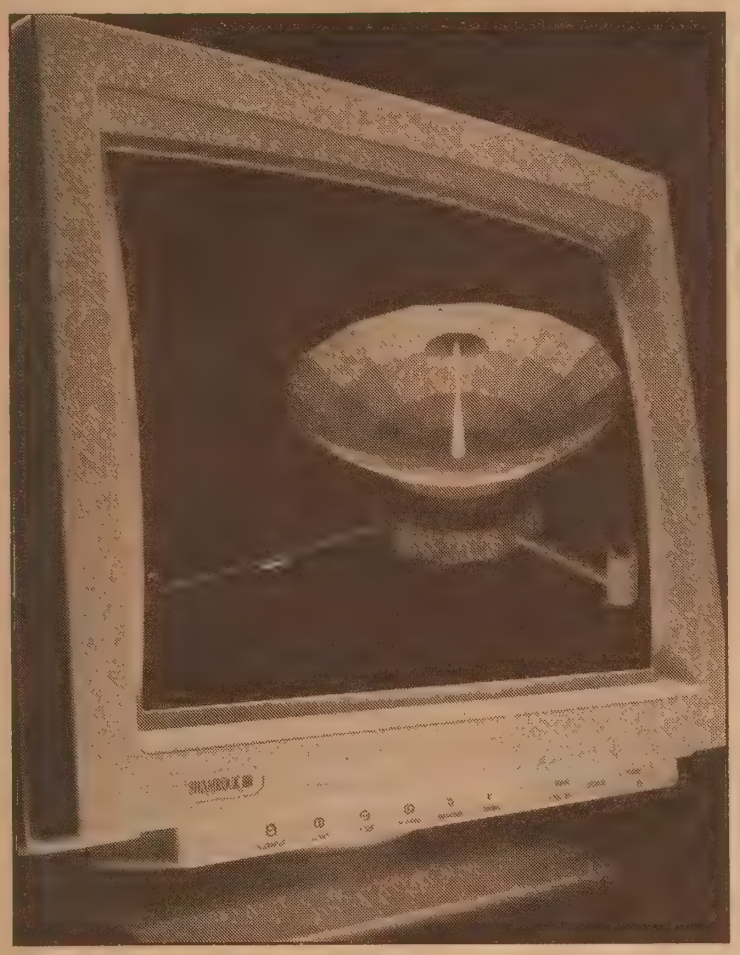

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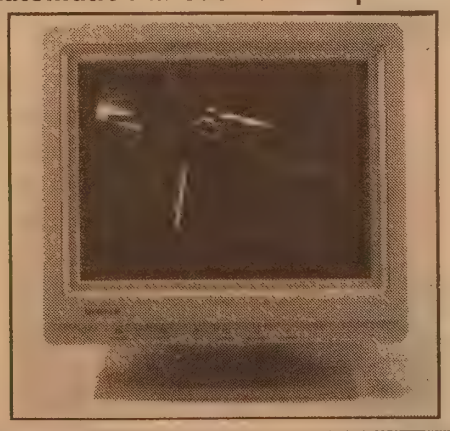

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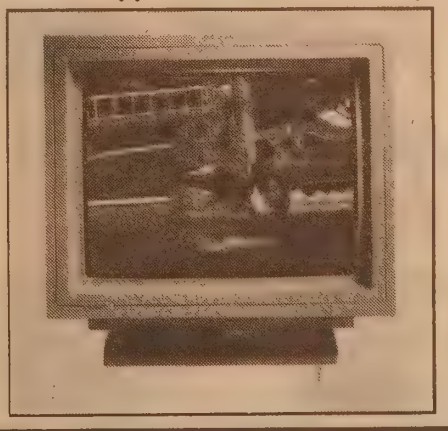

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OTHER ASPECTS

Full-motion morphs—involving two sequences of images as opposed to two still images—are, by their very nature, quite time-consuming. Both programs do their best to minimize your efforts. In theory, you'd have to set the points for every pair of images. However, with these packages, you only need to set the points on certain frames, and the software automatically interpolates the points on the in-between frames. Of course, the more frames on which you set the points yourself, the better the final result. However, if you're doing thirty frames per second, this could be quite a task.

Still morphs, though not as spectacular, are many times easier and faster to do. Interestingly, many morphs you see, which appear to be full-motion, are actually still morphs. The effect is achieved by having the target image in a different position, so that the flow of the morph gives the impression of movement. If done properly, this can be spliced right into a video sequence without having the viewer notice that stills were used.

The biggest hint I can give you in doing morphs is to make sure both images have similar backgrounds. Dissimilar backgrounds tend to detract from the morphing effect. Also, using similar image subjects with similar proportions, though not absolutely necessary, tends to yield better results.

Single-image morphing, called warping, can also be accomplished with either program. Warping basically allows you to stretch and compress an image, yielding a cartoon-like result.

For the videographer, imagine the response you'll get as you morph a childhood picture of the bride into an adult! A recent issue of a multimedia magazine had pictures of various film stars morphed half-way so the image had features of both people. You had to guess who the stars were. If nothing else, morphing is very entertaining.

COMPARISON

I found MorphPlus's vector-method to be easier to master than CineMorph's point grid. Using the grid, it was difficult not to distort areas which I just wanted to fade in. This is probably just a personal taste issue, since CineMorph's tutorial output was as good as I could have done with MorphPlus. Moreover, I also preferred MorphPlus's onion skin interface to CineMorph's two-window approach. The preview feature of MorphPlus was also helpful in making sure a morph was ready to be rendered.

However, despite ASDG's claim that MorphPlus is the fastest morphing product available for the Amiga, I found that CineMorph was much faster in rendering and required much less RAM overhead. Also, CineMorph's output format control was more straightforward to use. Both programs now support image processing via their sister programs, AD Pro and ImageFX, so they are quite versatile.

Numerical vector setting and other vector editing functions allow MorphPlus to be much more detailed and precise in setting up a morph. The cost is increased rendering time, more complex setup, and an appetite for RAM. Additionally, MorphPlus is much more expensive, though you get many other features besides morphing.

In a nutshell, CineMorph is fast and straightforward, while MorphPlus is slower and more complex. If you need to do detailed object morphing, MorphPlus would be my choice. Otherwise, you need to weigh the pros and cons of each product based on your own needs. Both of these are solid professional products and would be tremendous additions to your Amiga software library.■

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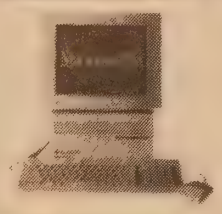

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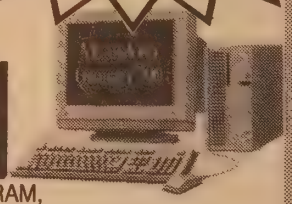

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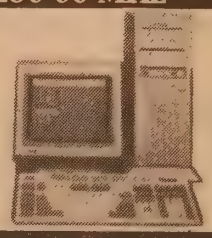

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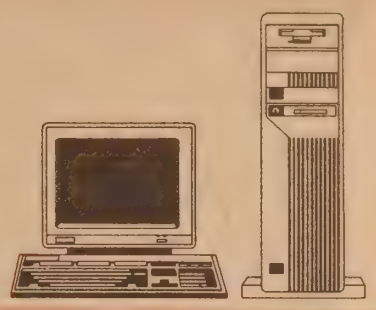

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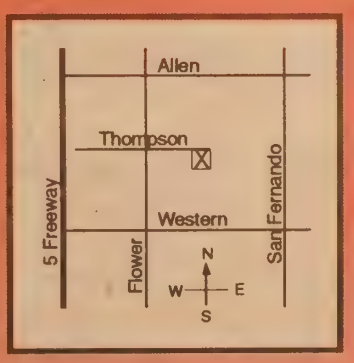

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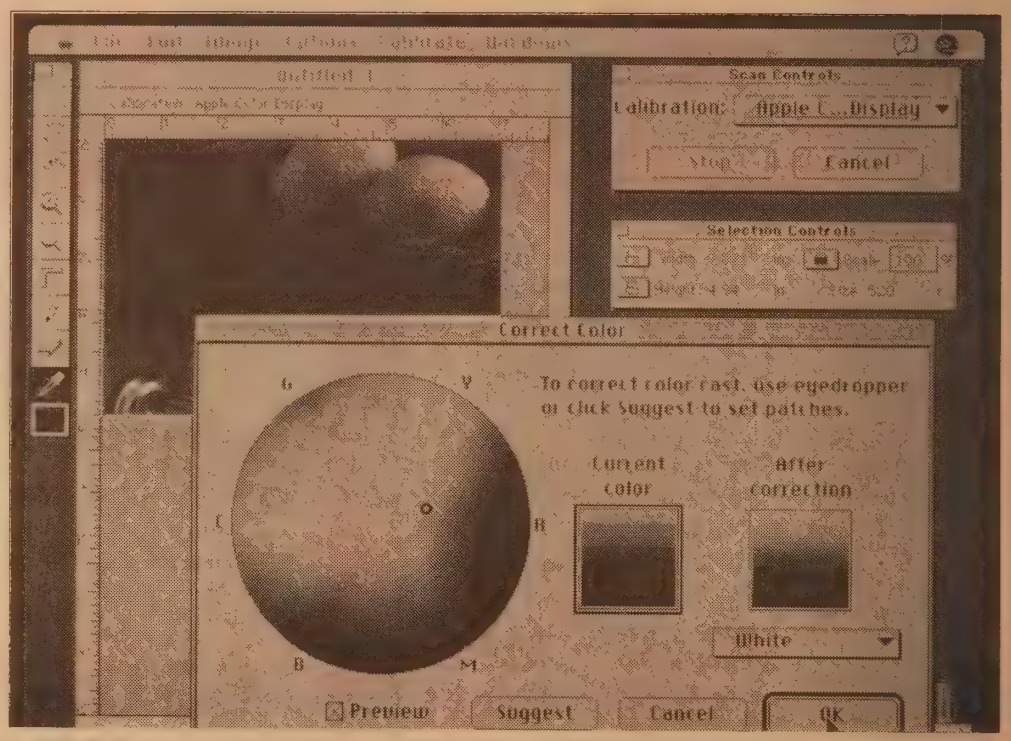
Apple's Full-Color Solutions

Ofoto 2.0 From Light Source Provides Revolutionary Scanning Capabilities

BY TONY REVEAUX

In 1984, with the ghost of George Orwell breathing down our necks, we had already begun to realize the dreams of affordable choices in personal computing. Just as I was poised to acquire a Kaypro, the "liberal writer's computer," I heard rumors of a new machine from Apple that would combine text and graphics within an advanced intuitive graphic user interface.

I bet on the Mac, all 128K of it, and never looked back. But one of the most persistent complaints we heard at the earliest meetings of ShowPage, the first Macintosh User's Group in the Bay Area, was, "Where's the color?" The Apple II, though comparatively more primitive in most other ways, had been color-capable for years.



Light Source's Ofoto 2.0 color scanning software offers color correction and color matching with calibration to input and output devices.

RESOURCES:

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APPLE COLOR

With the Macintosh II series, the Mac entered an evolving and enduring series of color solutions for graphics, desktop publishing, and multimedia. The one area in which Apple, as a manufacturer, has held back has been input and output: color scanning and printing; the company has left that to a host of third-party developers.

Now, as Apple approaches the tenth anniversary of the Macintosh, it has taken the next big step in desktop color publishing by providing these applications. The Apple Color One Scanner is a $1,499 300dpi flatbed grayscale and single-pass color scanner that comes bundled with Light Source's new Ofoto 2.0 color scanning software. The Apple Color Printer, listed at $2,599, is a 11 x 17 360dpi inkjet based on a Canon Bubble-Jet engine. According to *MacWEEK*, Apple is also ready to bring out a Color Classic, a $1,400 16-MHz 68030-based compact computer that supports 8-bit color displayed on a Sony 10-inch Trinitron tube. Color will also reputedly take to the road with the fresh PowerBook 165c and its 9-inch passive-matrix color LCD display.

The scanner and the printer, as good as they are, do not represent leaps of great magnitude. They, and the eagerly-awaited Color Classic and PowerBook 165c, are logical, incremental steps in product evolution. Ofoto 2.0, on the other hand, represents a definite advance in software technology.

Propelling Apple's march under the rainbow arch is ColorSync, which is a fundamental cornerstone in desktop color management. It would seem that Apple wanted to wait (wisely) until it could offer a total color solution before it extended its full product line into color versions and choices.

COLORSYNC: THE CORE TECHNOLOGY

Using color is complex and difficult. With monochrome imagery and output, differences in display and hard copy are degrees of resolution and dpi, between pixels that are either "on" or "off." With color, there are already variable differences between the chromatic languages of classes of devices. Monitors and most scanners use RGB, but printers use CMYK (Cyan, Magenta, Yellow and Black).

Not only that, different models of different brands of devices can vary wildly in terms of the range of RGB or CMYK that they can support. Even the same device can change over time. Translating an image between RGB and CMYK is a chancy and inexact science. Color calibrators, like those from RasterOps

Continued on page 123

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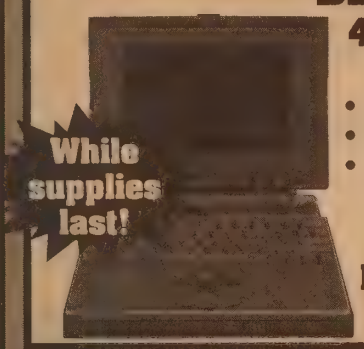

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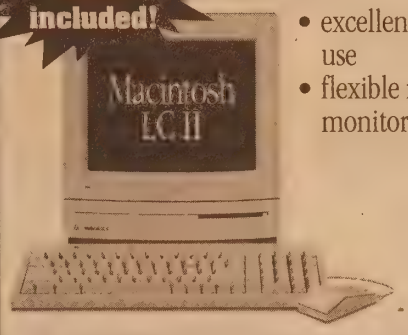

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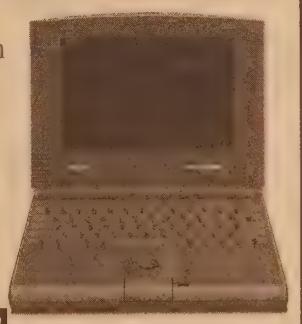

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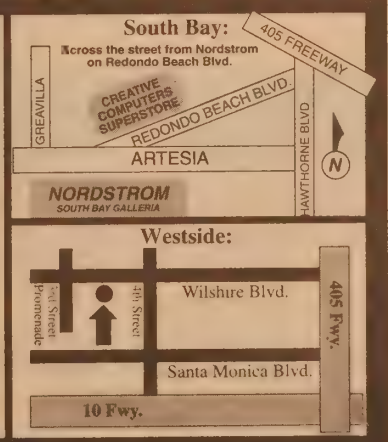

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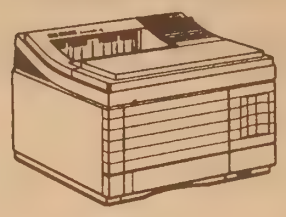

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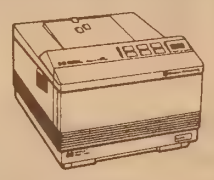

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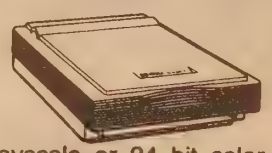

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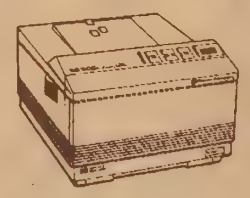

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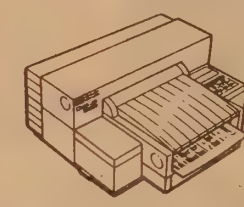

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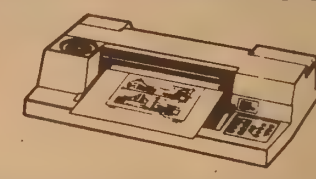

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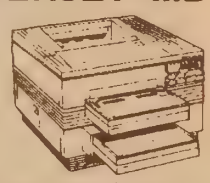

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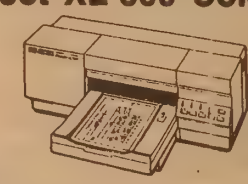

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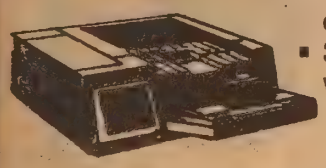

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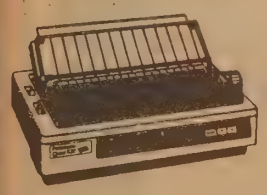

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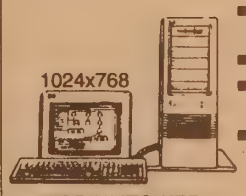

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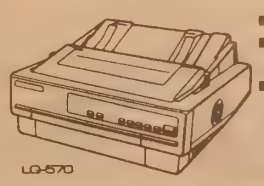

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Continued from page 118

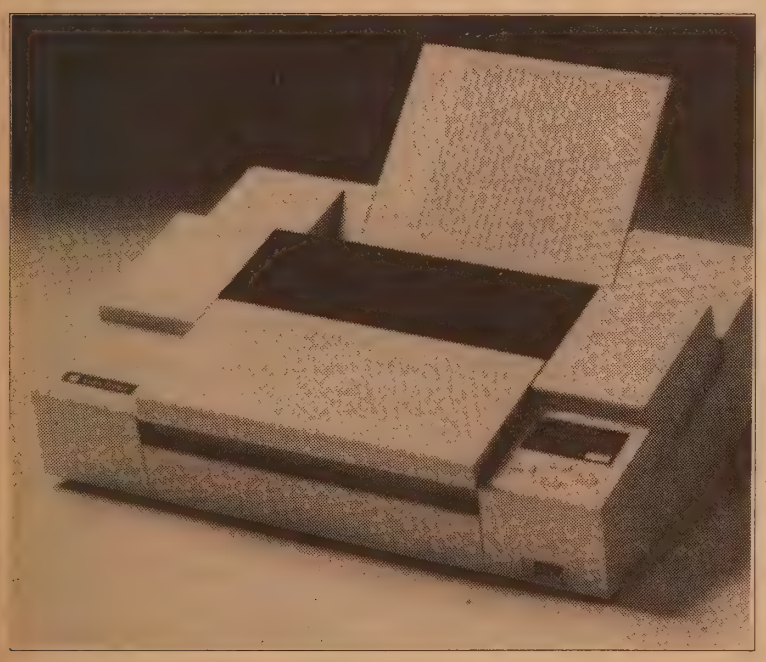
and SuperMac, can close the gap, but this is no task for the casual communicator.

ColorSync to the rescue!

Apple's ColorSync is a system extension to QuickDraw. Like QuickTime, ColorSync utilizes the Component Manager, which allows and encourages Apple or third-party color management resources and utilities to be added on. They provide an underlying support architecture which can coexist with other extensions and enhancements, acting as a sort of "upward system" environment.

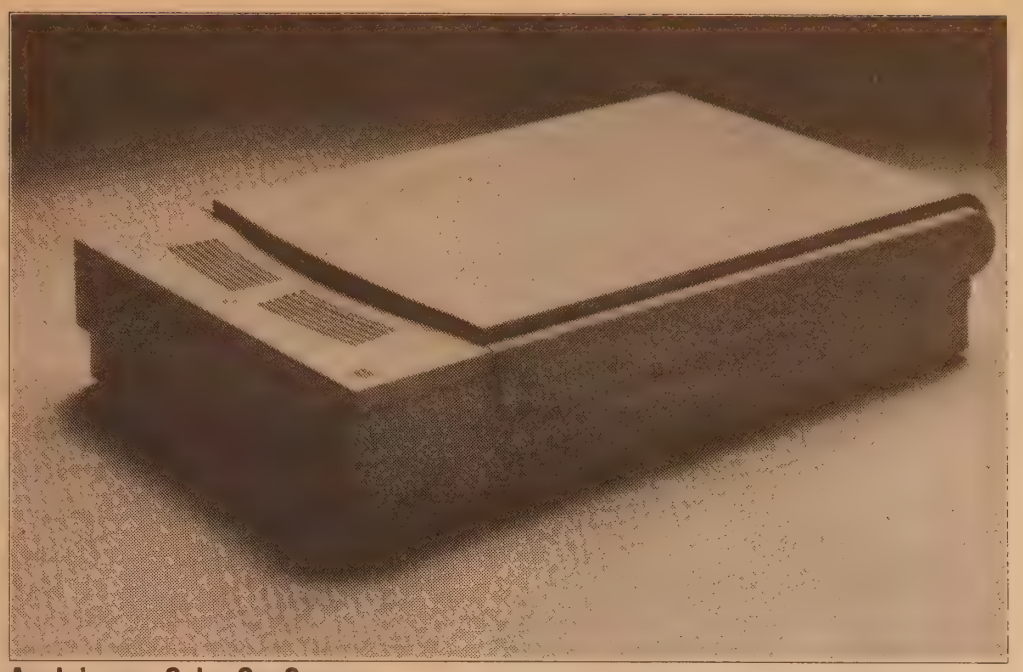
The color model it's based upon is called CIEZX, an international standard for describing perceptual color space, and each device is characterized in terms of that color space with printer driver, monitor driver and printer driver profiles. ColorSync matches the source image to the printer, and to the display as well, with a preview function that reveals which colors are not possible in terms of that color space. ColorSync adds the capability to define colors independently of the device creating the colors, and can go on from there to determine and create color matching models which can be saved and exported.

ColorSync doesn't pretend to be perfect. It provides a best-shot algorithmic approach to color matching which comes as close as possible. Companies like Light Source, Kodak, and EFI have already announced ColorSync-compatible applications, and more will follow.



Apples Color Printer

Following ColorSync from the systems factory will be QuickDraw GX, a totally new graphics model. This object-based graphics manager will simplify graphics operations for programmers. This should be translated into better products faster, and into easier applications for users. QuickDraw GX will support an open print architecture with enhanced typography and multiple-master-like font handling. QuickDraw GX will incorporate ColorSync directly, and support color spaces which exceed the ColorSync implementation under today's QuickDraw.



Apple's new Color OneScanner

OFOTO 2.0—THE COLOR SCANNING SOLUTION

Last year Apple turned desktop publishing's knob up a notch with the introduction of a new scanner bundled with Ofoto 1.0, revolutionary grayscale scanning software that simplified the scanning and printing of photographs, and allowed them to look like photos when they came out of the laser printer. Now, the color version of Ofoto is out ($350), and it proves that the sequel can be just as good if not better. It scans color photographs and other color images such that the printed page matches the original.

Ofoto scans images in one of two ways, automatically or manually. Autoscan does a low-resolution preview scan of the scanner platen to find the image and determine whether it is line art or a color or grayscale photograph. It then makes all scanning and printing parameter decisions automatically and does a high-resolution scan of the image.

Michael D. Solomon, president and co-CEO of Light Source, described the development goals of Ofoto 2.0: "We are the first application that is not a color management system, but is an application that is color management enabled. Because of our awareness of Apple's ColorSync, we took it a little bit further in that it is more separable.

"In Ofoto 1.0, you are always calibrating for either the printer or the monitor. Therefore, when you place the image into another application, and it's calibrated to the printer, it doesn't always look so good on the screen. In Ofoto 2.0, we are able to allow ColorSync to help us look right on the monitor, and yet it is using our printing technology. From the user's point of view, they can now see the image on the screen properly, and know that it is going to print correctly."

Sometimes photographs are taken with film that's not suited to existing lighting conditions (e.g., daylight film used under fluorescent lights). When this occurs there is a shift in the overall color of the image, commonly called a color cast. Ofoto provides the tools for correcting this problem, and can produce the image the photographer intended.

"Then," added Solomon, "there's the '*Sports Illustrated* Problem' — where a series of photos are taken under different lighting conditions, and the same object, like a player's jersey, will appear in different hues. With 2.0 you can go into the key image and choose and save the key color, and then go into the succeeding images, scan them, and correct the images to the saved key color. This can provide consistency over a series of images.

"Any adjustment that Ofoto makes will be made to the entire image, not just part of it. It is not an editing program per se. It is not area-specific, it is image-specific. We have the best product for getting images into image editing programs, because what they are getting is something that looks like that original image or scene, without having to use an image editing program to do that. Image editing programs have a hard time forcing an image to look natural.

"We added highlight and shadow control," he adds. "It is an automatic operation that is part of the scanning control. It sets the points of the dynamic range and interpolates while it scans. Ofoto 2.0 can also drop out background noise and paper color from an image. We have also added a focus capability. An out-of-focus picture can be brought into focus, on a one-button command. We have improved the sharpening algorithm. We have two kinds of sharpening in the program: sharpening line art, and a new algorithm, which can sharpen color photos.

"For users going to prepress, Ofoto does its own color separations. The Apple version of the (bundled) product does TIFF CYMK. In the standalone version, it also does EPS CYMK,

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which is a DCS (Desktop Color Separations) format. Ofoto 2.0," concludes Solomon, "does not have to be hooked up to a scanner to operate, to open up files and to work on them."

REALITY CHECK

How well will the new version of Ofoto enhance the use of color on the desktop, and is it really that "easy?" I asked two imaging professionals and early adopters what their experience has been so far.

Tom Zimberoff, a Sausalito-based photographer, is integrating the Ofoto 2.0 scanning software into a database template supported by FileMaker Pro, which he's developing with plans to market it to other photographers. "One of the most pragmatic uses of it," said Zimberoff, "is simply to keep a record of all of my shoots. It gives me the ability to scan in a Polaroid immediately upon completing a photographic assignment. It goes in with all the other data I've accumulated about the shoot. When I've finished, I'll input how much film I shot, which automatically carries over into the invoice.

"I can also look back at that record at any time and actually see an image of what it was that I shot. I can not only refer to the data in a literal form but also in a pictorial form."

He has chosen Ofoto 2.0 for its simplicity and accuracy. "Because I am an imaging professional I don't want to deal with more button-pushing than I have to. I like to keep it as simple as possible and concentrate on getting the job done, which is the distribution and the archiving of images."

Janet Butcher, president of Petaluma Imagesetting, a service bureau in Petaluma, has just begun to use Ofoto 2.0. "I have done a couple of jobs with [an early version of] it and so far, it works beautifully with the Color OneScanner. Ofoto 2.0 comes with pre-loaded calibrations for a lot of the output devices, such as for my Lino, and one for my QMS. I've scanned in several color photographs that are reproducing beautifully.

"On the screen, and in terms of output, it is taking advantage of every bell and whistle in the QMS, because as you know there are special screening algorithms in the ROMs of that printer that adjust for blends and things like that. Ofoto separates fine out of Quark and Aldus PrePrint, so I'm really impressed with it so far. It hasn't bombed once, and its really nice and slick, and the interface is really easy to understand."

The practical applications of the new color Ofoto in the professional arena were recently tested under fire. One of Butcher's clients who does robot design had lost the original art for a piece and needed to reproduce it for quantity duplication. "I can scan the printed piece, and because Ofoto is so wonderful at restoring and enhancing color, they won't have to go through the whole reverse process. Before, I would have to scan things multiple times and then go all the way through to match print, and then like as not have to do it over. But with Ofoto, because the calibration is so tight to the printers, I'm not having to do it over and over and over. Usually the first time its right." ■

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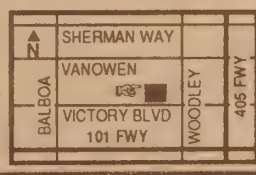

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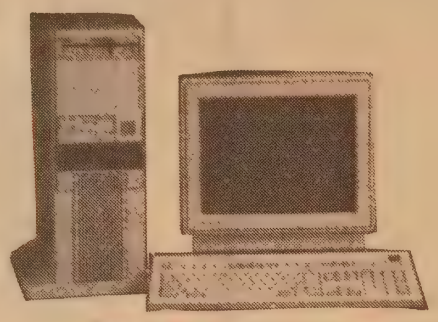

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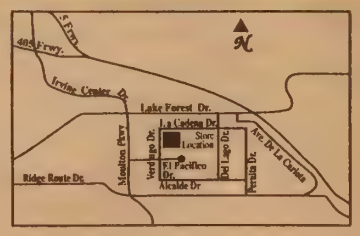

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Continued from page 76

amusing—there's a loop of the same ideas, the same concerns, same challenges.

How are these devices going to be marketed? They're going to be sold at AT&T phone centers—

That's announced, yes.

Do you envision doing direct sales, or selling through consumer outlets?

Probably. We have a plan which will unfold over the next eighteen months which enables new channels over time. There are two reasons: a)we can't tackle every channel at the same time, it's just not going to work; b) not all channels are ready. The consumer channel, which is very interesting for the products we have, is just not ready right now. They will be.

Our strategy is twofold. One is, for the large customers, by all means we'll do direct. Because that's how they want to buy—they want to talk to the people who invented the machine and know how it works. The big secret of distribution strategies is sell where the customer wants to buy. That's it. In the case of the large customer, they want to buy it here, and that's fine.

As the strategy unfolds, we are looking at ways to expand our retail distribution above and beyond the AT&T store, which is a great place for us because it's communications-oriented, and controlled in the sense that they have more money to train their salespeople than most dealers do. And we have a partnership with them—they're an investor here so they're motivated. It's not any dealer, it's my main investor. So that's a very good thing for us.

> "I believe [Newton] missed the boat totally, because doing what they talked about was beautiful technology, missing the fact that the most important need people have who are mobile and want portable devices is communication. I think the vendor position is out of whack; I think it's hard to sell a thousand-dollar super-great organizer."

We're looking for ways to expand that to some of the traditional computer channels, which are very eager to carry the product. We're working with a lot of cellular phone channels, which are untapped by anybody in our computer world, and which are very eager to carry the product. They see it as a transition product for them, away from the commoditized, cutthroat, sell-a-phone-at-two-dollars-more-or-less world to something that has more software services and other dimensions. They've never been able to sell computers, because they don't know that world, but we're kind of in the middle somewhere.

So we've had a lot of interest from the RBOCs [Regional Bell Operating Companies], and from a lot of the traditional cellular phone channels.

It's very interesting, because they come new to the table, they're not the same people I know. When I go to the computer shops I see all the people I work with; we talk about discount structures, all the normal things computer people talk about. When I meet with the Bell company, they're in their world, they want to sell the product because they feel it will help their customers communicate, and it will create traffic on their lines. Many of them are cellular operators themselves; almost all of them are. They see it as the terminal that creates demand.

So, totally different dynamics there. We're working very closely with quite a few of those Bell com-

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panies. This could be a very big thing in terms of distribution and sales.

The cellular modem is an add-on. What percentage of your customers do you think will go for that option?

We're trying to predict right now. The truth is, it's very hard to predict.

I'll tell you why. Customers are just starting to think about it. They don't know themselves. They never thought about it before. The guys we approach, they say, "Oh, you mean I could attach that to the EO? We need to think about it, it's not in our plan." You see their eyes lighting up—"Oh, yeah, so you mean if a guy forgot something he could get it from our server, from the parking lot of his customer?" "Oh, you mean he could have the names of all the customers and be calling them voice, and take notes at the same time? That's very good."

But there's no maturity to the idea. They're just being exposed to it now. So they can't even tell me, "We're going to buy that." Many of them say, "We've got to go study it."

So it's so early right now that I just can't tell you. We have had very positive response, but a surprised response. They say, "You mean you have that now? We thought it would be a few years from now that you could do that." They're just not ready. "You mean the guy can fax something from his car..."

Our goal is about 30% for the cellular modems. It's really too early for me to give you data; I'm giving you an opinion, what our goal is, and the response we're getting from our customers, which is excited and surprised.

Conceptually, how would you differentiate your product from what is known of Newton?

That's hard. The first pass of Newton that we saw had very little emphasis on communications. It seems that has changed recently, but the first thing we saw was an emphasis on personal assistants, a neat idea. So, a different center of gravity.

To simplify, it was more the super-advanced Sharp Wizard than the super-advanced phone. So we were going after different targets, and that's the big difference. I'm going to do everything I can to make your communications life better. We have a lot more to do. It was a telling thing, I thought, that modems were not even on the list of Newton's features the first time I saw it.

Now can Newton come back and incorporate communications? I'm sure they can. I believe they missed the boat, by the way, totally, because doing what they talked about was beautiful technology, missing the fact that the most important need people have who are mobile and want portable devices is communication. I think the vendor position is out of whack; I think it's hard to sell a thousand-dollar super-great organizer.

I'd like to talk again when it's there, because I'd be in a better position to really see. it seems like they've shifted as they've gone along—they're smart, and I'm sure they'll adapt to the reality of the world.

How long do you think it will take for this to be a broadly accepted technology instead of a niche?

Two or three years.

How quickly do you expect prices to fall?

I think we're going to drop, at equal functionality, 20% a year or something. There will be cheaper products with less functionality, there's a difference.

I don't expect it to fall faster than the rest of the industry, and PC prices have stopped falling so rapidly. The curve is flattening. Part of the curve was not really any physics law or technology law; it was really a matter of eating channel margin and reducing operating expenses. In that sense, we start clean, because we have lower operating expenses from day one, and pretty lean and mean channels. So there is nothing to eat there. We now have history, so we know what to do, right? We're not going to go and build an expensive channel.

Mid- to long-term, do you expect to be building different-size devices?

Not long-term, mid-term. It is our declared strategy to build multiple-sized devices, with the same user experience, the same software, same user interface, same feel, so you can really buy the small, the medium, or the big. We think that's one of the strengths we can bring to the market, a product line that shares the same software and the same user experience. And we're doing that very actively. ■

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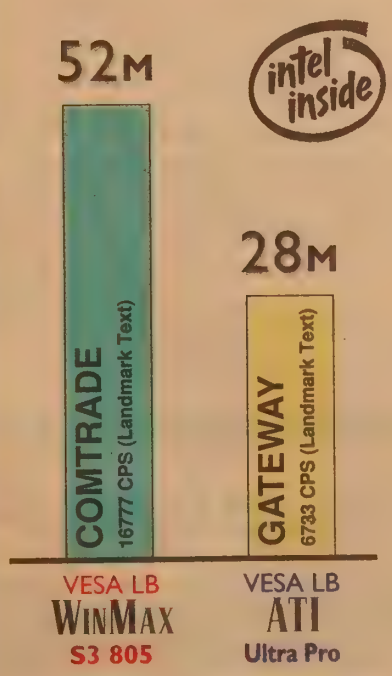

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486 EISA Local Bus Rocket

- Ultimate Full 32-Bit Screaming Performance 256K Ultra Fast Write Back Cache SRAM
- 8 MB RAM & Expandable to 128MB
- 1.2 MB 5.25" & 1.44 MB 3.5" Floppy Drive
- 250 MB Ultra Fast 12ms IDE 64K Cache Drive
- 32-Bit EISA Hard Disk Controller (4X faster DTR)
- 32-Bit **VL-Bus WinMax S3-805** Graphics Accelerator (Up to 50X faster than Standard SVGA)
- 15" Flat Screen Non-interlaced .28mm SVGA Monitor
- 2 Serial, 1 Parallel & 1 Game Ports
- Enhanced 101-key Keyboard
- Hi-Resolution 400DPI Serial Mouse

486/33 DX	$2245
486/50 DX2	$2595
486/50 DX	$2495
486/66 DX2	$2595

- 17" Flat Screen Non-interlaced Monitor Add $440

VESA Local Bus SVGA

- 64K Super Fast Write-Back Cache SRAM
- 4 MB RAM & Built-in 487 Math Coprocessor
- 1.2 MB 5.25" & 1.44 MB 3.5" Floppy Drives
- 170 MB 15ms IDE 64K Cache Drive
- 32-Bit **VL-Bus** Accelerated Super VGA with 1MB RAM (Up to 1280x1024 & 16.7M Colors) (Up to 10X faster than Standard SVGA)
- 14" Non-interlaced .28mm SVGA Monitor (Bigger edge to edge 72Hz flicker-free display)
- 2 Serial, 1 Parallel & 1 Game Ports
- Enhanced 101-key Keyboard
- Hi-Resolution 400DPI Serial Mouse

486/33 DX	$1625
486/50 DX	$1875
486/66 DX2	$1945

- 8MB RAM & 250MB 12ms Drive Add $280
- 32-Bit VL-Bus IDE Hard Disk Controller Add $60

Two Convenience Locations

COMTRADE
818.961.6688
Fax 818.369.1479
Hours: 9:00-7:00 Pacific Mon-Sat
15314 East Valley Boulevard
City of Industry, California 91746
Freeway 60 Exit Hacienda Blvd (North)

MAXIMUS
818.585.0888
Fax 818.585.1701
Hours: 9:00-7:00 Pacific Mon-Sat
912 East Union Ave
Pasadena, California 91107
Freeway 210 Exit Lake Ave (South)

RESOURCES

Calendar Of Events

CALENDAR LISTING CHANGES

Beginning with issue #100, the Calendar listings were reorganized into two sections. The first part includes conferences, shows, and other special events. The second presents classes, seminars, and workshops.

We hope this will help you more easily find the information you are searching for as well as stay informed of the latest events and resources that are available to you.

Thank you,
MicroTimes staff

CONFERENCES, SHOWS, AND OTHER SPECIAL EVENTS

JANUARY

January 25–28 Client/Server '93 Conference & Exposition. San Jose. CMP Publications. Call: 1-800-972-5244.

January 25–29 USENIX Winter 1993 Technical Conference: The Challenge Of Innovation. San Diego. USENIX. Call: (714)588-8649.

January 26–27 EMA Membership Meeting. Tampa, FL. EMA. Call: (703)875-8620.

January 27 Software Council Of Southern California Networking/Dinner Meeting. Los Angeles. Software Council of Southern California. Call: (310)328-0043.

January 28 Software Council Of Southern California Networking/Dinner Meeting. Woodland Hills. Software Council of Southern California. Call: (310)328-0043.

January 28–30 Technology, Reading & Learning Difficulties Conference. Santa Clara. Educational Computer Conference. Call: (510)222-1249.

January 30 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

January 31 Computer Show & Sale. Ventura County Fairgrounds. MarketPro Shows. Call: (415)388-8893.

FEBRUARY

February 1–4 ComNet's 15th Anniversary Conference And Exposition. Washington, D.C. World Expo Corp. Call: 1-800-982-8188.

February 6 Computer Show. Sherman Entertainment Center, Reseda. Computer Marketplace. Call: 1-800-800-5600.

February 6 Computer Show & Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-433-7469.

February 7 Computer Show. Sequoia Conference Center, Buena Park. Computer Marketplace. Call: 1-800-800-5600.

February 7 Computer Show & Sale. Antelope Valley Fairgrounds. MarketPro Shows. Call: (415)388-8893.

February 7 Computer Show & Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-433-7469.

February 13 Computer Show & Sale. CSUN, north campus. Richard James Corp. Call: 1-800-433-7469.

February 14 Computer Show & Sale. Orange County Fairgrounds, Costa Mesa. Richard James Corp. Call: 1-800-433-7469.

February 16–18 mobile93 Conference And Trade Show. San Jose. Technologic Partners. Call: Natalie Paulucci, (212)696-9330.

February 17–18 Graphic Arts '93 Exposition And Conference. Los Angeles. ImPressTech. Call: (415)864-3151.

February 20–21 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

February 22–26 Software Development 1993 Conference And Exhibition. Santa Clara. Miller Freeman, Inc. Call: (214)245-6012.

February 24–26 Orlando Multimedia '93: 11th Annual Conference On Interactive Instruction Delivery. Kissimmee, FL. Society for Applied Learning Technology. Call: 1-800-457-6812.

February 27 Computer Show & Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-433-7469.

MARCH

March 1–3 Second Annual Windows Hardware Engineering Conference. San Jose. Microsoft. Call: 1-800-421-6338.

March 3–5 Mobile World Conference & Exposition. Boston. DCI. Call: (508)470-3880.

March 6 Computer Show & Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-433-7469.

JANUARY 30
FEBRUARY 20–21

COMPUTER SHOW

Pomona

Computer Marketplace computer shows feature over three hundred exhibits with thousands of products. They are now featuring seminars open to all users—from the beginner to the advanced computer user. Admission is $6.00 and shows are from 10:00 am to 5:00 pm. Los Angeles County Fairgrounds (Fairplex), Pomona. Call: 1-800-800-5600.

March 7 Computer Show & Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-433-7469.

March 13 Computer Show. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

March 14 Computer Show. Sequoia Conference Center, Buena Park. Computer Marketplace. Call: 1-800-800-5600.

March 14 Computer Show & Sale. Orange County Fairgrounds, Costa Mesa. Richard James Corp. Call: 1-800-433-7469.

March 27 Computer Show & Sale. CSUN, north campus. Richard James Corp. Call: 1-800-433-7469.

APRIL

April 6–8 International Spectrum '93 Exhibition And Conference: BusinessPerson's Computer Show. Anaheim. IDBMA. Call: 1-800-767-SHOW.

April 26–29 NCGA '93 Conference: Computer Graphics Solutions—Applications For Implementation. Philadelphia. NCGA. Call: (708)698-9600.

April 27–30 Incotek '92: Exhibition And Conference For Telecommunications And Information Systems. Warsaw, Poland. Global Technologies. Call: Karen Ventimiglia, (202)797-3782.

Continued

Computer MARKETPLACE

COMPUTER TRADE SHOW
WHOLESALE PRICES
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1993 SHOW DATES

January 30 Saturday	**POMONA** - L.A. County Fairgrounds (Fairplex) Exit Highway 10 at Fairplex Drive. Go North to Mckinley, turn right. Turn Left on White Avenue to Gate 14.
February 6 Saturday	**RESEDA** - Sherman Entertainment Center From 101 Freeway, take Reseda off ramp, turn left (if traveling East) on Reseda Blvd. to Sherman Way, turn right, one block to Canby Street. 18430 Sherman Way.
February 7 Sunday	**BUENA PARK** - Sequoia Conference Center Take the Beach Blvd. Exit off the 91 Freeway, go one block North to 7530 Orangethorpe.
February 20 & 21 Saturday & Sunday	**POMONA** - L.A. County Fairgrounds (Fairplex)
March 13 Saturday	**POMONA** - L.A. County Fairgrounds (Fairplex)
March 14 Sunday	**BUENA PARK** - Sequoia Conference Center

POMONA SEMINARS

Windows 3.1	Prodigy
PC DOS Crash Course	What LANs Can Do For You
Buying Your First Computer	Make Money With Your PC
Evaluating Software Needs	Windows Based Applications
DOS Based Applications	Computer Consulting for Profit

Co-sponsored with Team Vision & Focus Automation

(408) 778-5200 or 800-800-5600

Calendar Of Events continued

CLASSES, SEMINARS, AND WORKSHOPS

JANUARY

January 29 Intro To The IBM PC Class (Español). Monrovia. The Organizers. Call: (818)303-3311.

January 30 Intro To The IBM Class. Monrovia. The Organizers. Call: (818)303-3311.

JANUARY 26

GNU BoF (BIRDS OF A FEATHER) MEETING

San Diego

There will be a GNU (GNU's Not UNIX) BoF meeting at the San Diego USENIX. It is scheduled for Tuesday, January 26 at 8:00 pm. Double check the time and place at the BoF board near the registration area at USENIX. The goals are to meet past, present, and future GNU contributors, and to answer questions about the GNU Project and the Free Software Foundation (FSF). Richard Stallman from FSF will be present. The meeting is open to non-USENIX attendees. Town and Country Hotel, 500 Hotel Circle N., San Diego. (619)291-7131.

January 31 Intro To The IBM PC Class. Monrovia. The Organizers. Call: (818)303-3311.

FEBRUARY

February 1 Freelance Graphics For DOS Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 2 Windows Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 3 Beginning DrawPerfect Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 5 Beginning Symphony Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 6 Beginning WordPerfect 5.1 Class. Monrovia. The Organizers. Call: (818)303-3311.

February 8 Intro To The IBM PC Class. Monrovia. The Organizers. Call: (818)303-3311.

February 9 Beginning Paradox Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 9 Moving Up To WordPerfect For Windows Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 10 Beginning Lotus 1-2-3 Class. Monrovia. The Organizers. Call: (818)303-3311.

February 11 DOS/Hard Disk Skills Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 12 Publishing Power With WordPerfect Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 17 Beginning WordPerfect 5.1 Class. Monrovia. The Organizers. Call: (818)303-3311.

February 18 Freelance Graphics For Windows Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 19 WordPerfect 5.1—Tables, Macros & Merges Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 20 Beginning Lotus 1-2-3 Class. Monrovia. The Organizers. Call: (818)303-3311.

February 21 Quicken 6.0 Class. Monrovia. The Organizers. Call: (818)303-3311.

Continued on page 140

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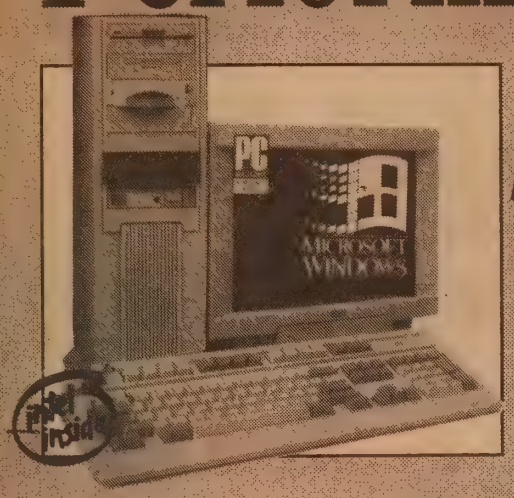

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486DX2-66 ISA 256K Cache w/105MB H/D — $1449

NOTEBOOKS

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2MB RAM • 60MB H/D • VGA (Sanyo)
$1139

486SX-25MHz
4MB RAM • 120MB H/D • VGA
$1569

486SX-33MHz
4MB RAM • 120MB H/D • VGA
$1999

LOCAL BUS SUPERSTATIONS

WINDOWS

- 486DX-50 EISA 256K Cache w/105MB H/D — $1529
- 486DX-50 Local Bus 256 K Cache w/105MB H/D — $1369
- 486DX-50 ISA 256K Cache w/105MB H/D — $1339
- 486DX2-50 ISA 256K Cache w/105MB H/D — $1189
- 486DX-33 EISA 256K Cache w/105MB H/D — $1349
- 486DX-33 Local Bus 64K Cache w/105MB H/D — $1179
- 486DX-33 64K Cache w/105MB H/D — $1129

SYSTEMS

- 486SX-25 Local Bus 64K w/105MB — $1029
- 486SX-25 64KCache w/105MB H/D — $979
- 386DX-40 64K Cachew/105MB H/D — $909
- 386DX-33 64KCache w/105MB H/D — $879
- 386SX-33 w/105MB H/D — $829
- 286AT-20 w/105MB H/D — $789

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- 120MB or 210MB SCSI H/D
- 1.2MB & 1.4MB FD
- SVGA N-I Color Monitor
- 24/96 Fax & Modem or 14.4K F/M

5 Workstations
- 386SX-25MHz
- 1MB Ram, 1.2M F/D & Mono Monitor

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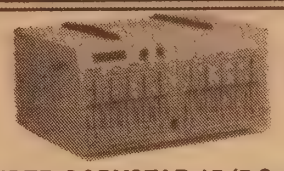

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- Model CM 510 H (5 1/4" 1.2MB FD)
- Model CM 610 H (3 1/2" 1.4MB FD)
- Format Suitable: Auto Switch 2D/2HD
- Copy Track: 0-39/0-79
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- AC Input: 110V/220V, 50Hz/60Hz
- Cooling Fan: DC 12V, 0.12A
- Size (LxWxH mm): 368x254x258
- Packing Size (LxWxHmm): 500x376x384
- Net Weight: 13.5 Kgs

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VEGA 486DX2-66MHz EISA w/256K Cache (US Made)	$1039
OPTI 486DX2-66MHz EISA w/256K Cache	$929
VEGA 486DX-50MHz EISA w/256K Cache (US Made)	$949
OPTI 486DX-50MHz EISA w/256K Cache	$849
VEGA 486DX-33MHz EISA w/256K Cache (US Made)	$779
OPTI 486DX-33MHz EISA w/256K Cache	$669
486DX2-66MHz ISA w/256K Cache	$749
486DX-50MHz ISA w/256K Cache	$669
486DX2-50MHz ISA w/256K Cache	$609
486DX-33MHz ISA w/256K Cache	$489
486DX2-66MHz ISA Local Bus w/256K Cache	$769
486DX-50MHz ISA Local Bus w/256K Cache	$689
486DX2-50MHz ISA Local Bus w/256K Cache	$649
486DX-33MHz ISA Local Bus w/64K Cache	$469
486SX-25MHz w/64K Cache Exp. 256K	$299
386DX-40MHz w/64K Cache	$189
386DX-33MHz w/64K Cache	$179
386SX-25/33MHz	$139
386DX-25MHz	$169
386SX-25MHz	$119
AT 286-20MHz	$79

• SMARTLINK MODEMS •

Internal 2400BPS w/Comit. NMP Class 5 Software	$32
Internal 9600BPS/2400BPS Send/Receive Fax/Modem (Includes Superfax For Windows 3.1 & Comit. S/W)	$67
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External 24/96/14.4K	CALL

• KEYBOARDS •

BTC 5339 101 Keys	$32
FOCUS 2001 101 Keys	$41
FOCUS 5001 130 Keys	$60
FOCUS 7000 101 Keys	$38
FOCUS 8000 111 Keys	$47
FOCUS 9000 128 Keys	$72
Fujitsu 4700 101 Keys	$45

• MICE •

Summagraphic 12x12, 12x18	CALL
Microsoft Mouse Serial (OEM)	$49
Microsoft Mouse Serial & PS/2 Version	CALL
Microsoft Mouse Bus Version	$92
Logitech Serial Combo Mouseman	CALL
Logitech Trackball	CALL
Logitech Fotoman	$596
Logitech Scanman 32GS/O.C.R.	$205
Logitech Scanman 256G/O.C.R.	$327
Mouse Pens (For Notebook/Laptops)	$37
Z-Nix Mouse w/Windows 3.1	$49

• ARCNET/ETHERNET •

8 Bit, Arcnet	$45
8 Bit, Ethernet	$95
16 Bit, Arcnet	$75
16 Bit, Ethernet	$99
NETWARE VER. 2.2 (5/10 USER)	CALL
NETWARE VER. 3.11 (5/10/20 USER)	CALL
SUNSOFT (ICS) UNIX	CALL
SUNSOFT (ICS) UNIX W/S PLATFORM	CALL
SUNSOFT (ICS) UNIX WINDOWING	CALL

• CD-ROM •

SONY C535 (Bus Card Included)	$342
SONY C31A (Interface Card Included)	$284
MITSUMI (Interface Card Included)	$272

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ULTRA12F-24 1:1 (24MBits)ESDI F/HD	$159
ULTRA12C ESDI Caching F/HD Controller w/1M	$385
ULTRA15C IDE Caching F/HD Controller w/1M	$225
ULTRA15C IDE Up To 8MB SIMM	$189
ULTRA22F ESDI 32 Bit 64K Cache	$349
ULTRA24F SCSI 32 Bit 64K Cache	$379
DC99 IDE 16 Bit Cache Controller (Up to 8MB)	$129
AHA-1542B SCSI Floppy/HDAdapter	$229
AHA 1542BK SCSI Bus Master Host Adapter	$269
AHA 1522 16 Bit DOS SCSI	$129
AHA 1522K 16 Bit w/Kit SCSI	$169

• VIDEO/CONTROLLER •

MGP	$15
VGA 800x600 256K Cache	$29
Trident 512K	$39
Trident 1MB	$64
ATI VGA Wonder XL 1MB (32,768 Colors)	$125
ATI VGA Wonder 1MB	$105
ATI Graphic Ultra1MB VRAM	$359
ATI Graphic Ultra/Ultra Plus 1MB VRAM Card	CALL
ATI Graphic Vantage1MB	$225
ATI Stereo F/X Sound Card	$125
Diamond Speed Star 24X 1MB (16 Million Colors)	$179
Diamond Stealth 1MB(VRAM)Window Accelerator	$225
Orchid Pro-Designer II 1MB VGA Card	$145
Orchid Pro-Designer IIs EISA Sierra 1MB	$175
Orchid Fahrenheit 1280, 24 Bit, 1MB (16.7 Million Colors)	$235
AT I/O (2S, 1P, 1Game) Ports	$9
AT IDE (Dual HD/FD Controller) w/Cable	$9
AT Super IDE w/I/O (Dual HD/FD) Controllers	$13

• HARD DISK /TAPE BACKUP•

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Maxtor All Models	CALL
Conner All Models	CALL
1.2MB FDD (5.25")	$55
1.4MB FDD (3.5")w/Mounting Kit	$52
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80MB IDE HDD (17ms)	$219
120MB IDE HDD (17ms)	$269
170MB IDE HDD (17ms)	$299
210MB IDE HDD (16ms)	$359
340MB IDE HDD (13ms)	$649
340MB SCSI HDD (13ms)	$669
535MB IDE HDD (12ms)	$899
675MB IDE HDD	$1149
676MB ESDI HDD (16.5ms)	CALL
675MB SCSI HDD (16.5ms)	CALL
1.2GB SCSI HDD (13ms)	CALL
120M Tape Back Up Internal	$199
250M Tape Back Up Internal	$269
2GB Tape Back Up Internal	CALL

• MONITORS •

Edition 14" Amber	$85
Edition 14" White	$85
Edition 14" SVGA .39DP	$228
Shamrock 14" (1024x768).28DPI Interl	$268
Shamrock 14" (1024x768).28DPI N-I	$299
Shamrock 15" (1280x1024).28DPI N-I	$449
Shamrock 20" (1280x1024).28DPI N-I	$1299
NEC Multisync 3FGX 15" (1024x768, 28DP)	$669
NEC Multisync 4FG 15" (1024x768, 28DP)	$779
NEC Multisync 5FG 17" (1280x1024, 28DP)	CALL
NEC Multisync 6FG 21" (1280x1024, 28DP)	CALL
Mitsubishi Diamond Pro 17" (1280x1024, .26DP)	CALL
Sony CPD-1604S 17" (Non-Interlaced, .25DP) Color	CALL
Viewsonic 7 17" Multi-Frequency(1280x1024).28DPI	CALL
MAG 17" Mx17H (1024x768, .26 DPI)	CALL

COMPLETE SYSTEMS ABOVE INCLUDE:
1MB RAM of High Speed 70ns
1024 x 768 SVGA card
105MB IDE Hard Drive
1.2MB & 1.4MB Floppy Drive
1 Parallel, 2 Seriel, 1 Game Port(s)
14" SVGA Color Monitor
101 Key Enhanced Keyboard
Desktop or Tower Case w/Digital Display
Serial Mouse

UPGRADES

VIDEO UPGRADE
- Diamond Speed Star 24x1MB $139
- Diamond Stealth1MB VRAM $195
- Local Bus VGA 1MB (1280x1024) $105
- SVGA 1MB Windows Accelerator (1280x1024) $75

HARD DISK
- 210MB IDE 15ms $169
- 340MB IDE 15ms $479
- IDE 16 Bit Cache Controller $119
- IDE 32 Bit Cache Controller $339

MONITOR UPGRADE
- Shamrock 14" Non-Interlaced 1024 x 768, .28DP $85
- Shamrock 15" Non-Interlaced 1280 x 768, .28DP $239
- Shamrock 20" Non-Interlaced 1280 x 768, .28DP $1159
- MAG 17" Non-Interlaced 1280x1024, .26DP $939
- ViewSonic 7 17" N-I 1280x1024, .28DP $819
- Sony 1404 17" N-I $729

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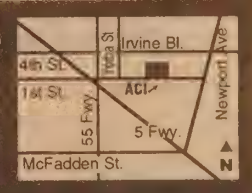

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386DX CACHE SYSTEMS

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- 64K cache
- TEAC 1.2MB floppy drive
- TEAC 1.44MB floppy drive
- **105MB IDE hard drive,** ***16ms access time with 32K cache***
- 14" SVGA color monitor, 1024x768
- 16 bit SVGA graphics adapter with 512K
- 2 serial, 1 parallel, 1 game ports
- 101 enhanced keyboard
- Minitower or minidesktop case

Price	regular	CASH
386DX-33MHz	$975	$899
386DX-40MHz	$1000	$925

Upgrade to: Maxtor 130MB ADD $30
Conner 170MB ADD $70

486DX VESA Local Bus system

- INTEL 80486 CPU
- 3 VESA Local bus slots
- 4MB RAM, 70ns
- 64K cache
- TEAC 1.2MB floppy drive
- TEAC 1.44MB floppy drive
- **130MB Maxtor hard drive,** ***15ms access time with 64K cache***
- 14" SVGA monitor, .28 dot pitch, 1024x768
- **VESA local bus 32 bit SVGA accelerator card with 1MB, displays up to 16 million colors**
- 2 serial, 1 parallel, 1 game ports
- 101 enhanced keyboard
- Minitower or minidesktop case

Price	regular	CASH
486SX-25MHz	$1275	$1199
486DX-33MHz	$1475	$1399

486DX EISA SYSTEM

- INTEL 80486 CPU
- 4MB RAM, 70ns
- 256K cache
- TEAC 1.2MB floppy drive
- TEAC 1.44MB floppy drive
- **130MB Maxtor hard drive,** ***15ms access time with 64K cache***
- 14" SVGA monitor, .28 dot pitch 1024x768
- **EISA 32 bit SVGA accelerator card with S3 accelerator chipset and 1MB VRAM**
- **EISA 32 bit IDE caching controller with 512K 4HD/2FD support, fast *16.5 MByte/sec transfer rate!***
- 2 serial, 1 parallel, 1 game ports
- 101 enhanced keyboard
- Minitower or minidesktop case

Price	regular	CASH
486DX-33MHz	$1999	$1899
486DX-50MHz	$2199	$2099

INTEL 486 HIGH PERFORMANCE SYSTEMS

- INTEL 80486 CPU
- 4MB RAM, 70ns
- 64K cache
- TEAC 1.2MB floppy drive
- TEAC 1.44MB floppy drive
- **130MB Maxtor hard drive,** ***15ms access time with 64K cache***
- 14" SVGA color monitor, .28 dot pitch 1024x768 resolution
- 16 bit SVGA card with 1MB 1024x768x256 colors
- 2 serial, 1 parallel, 1 game ports
- 101 enhanced keyboard
- Minitower or minidesktop case

Price	regular	CASH
486SX-25MHz	$1175	$1099
486SX-33MHz	$1225	$1149
486DX-33MHz	$1375	$1299
486DX-50MHz	$1575	$1499
486DX2-50MHz	$1475	$1399
486DX2-66MHz	$1625	$1549

ADD $100 to upgrade to 32 bit VESA LOCAL BUS system includes motherboard with 3 V.L. slots and 32 bit SVGA card, 16.7 million colors

ADD $200 to upgrade to 15" flat screen SVGA monitor 1280x1024 non-interlaced, .28 dot pitch

ADD $40 to upgrade to 170MB Connor hard drive 17ms access time, 64K cache

ADD $30 to upgrade to 256K cache

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Sun.	Closed

486DX CAD
Windows workstation with 17" N.I. monitor

- INTEL 80486 CPU
- 8MB RAM, 70ns
- 256K cache
- TEAC 1.2MB floppy drive
- TEAC 1.44MB floppy drive
- **213MB Maxtor hard drive,** ***15ms access time with 64K cache***
- **17" SVGA flat screen monitor,** .28 dot pitch 1280x1024 non-interlaced, digital auto-tracking low radiation, made by Panasonic in Japan
- **Diamond Speed Star 24** SVGA card with 1MB displays up to 1280x1024, and up to ***16 million colors***
- 2 serial, 1 parallel, 1 game ports
- 101 enhanced keyboard
- Minitower or minidesktop case

Price	regular	CASH
486DX-33MHz	$2399	$2299
486DX-50MHz	$2599	$2499

14" MGC SVGA monitor
1280x1024 N.I.
VESA Standard
.28 dot pitch

$299

Diamond Speed Star 24
SVGA card with 1MB
24 bit, 16.7 million colors
displays up to 1280x1024
72Hz refresh

$145

170MB Conner hard drive
17 ms access, 64K cache

$280

Multi-Media Kit from Creative Lab

$540

Sound Blaster Pro
Creative Labs CD-ROM Drive (Panasonic) and 6 CD-ROM discs

Windows 3.1, M.S. Bookshelf, M.S. Works for Windows, Macromind Action, Authorware Star, Tempra Graphics, and Sherlock Holmes, Consulting Detective

Special
with Purchase of Any System
DOS 5.0
Windows 3.1
Mouse

Only $99

Motherboards (OK, with CPU)

		regular/CASH
486DX2-66MHz	ISA	$710/$680
with 64K cache	EISA	$910/$880
and up to 32MB	Vesa Local Bus, 3 V.L. slots	$760/$730
486DX-50MHz	ISA	$650/$620
with 64K cache	EISA	$850/$820
and up to 32MB	Vesa Local Bus, 3 V.L. slots	$700/$670
486DX-33MHz	ISA	$450/$420
with 64K cache	EISA	$650/$620
and up to 32MB	Vesa Local Bus, 3 V.L. slots	$500/$470
486SX-33MHz	ISA	$315/$308
with 64K cache	Vesa Local Bus, 3 V.L. slots	$365/$358
486SX-25MHz	ISA	$270/$265
with 64K cache	Vesa Local Bus, 3 V.L. slots	$320/$315
386DX-40MHz with 64K cache		$185/$180
386DX-33MHz with 64K cache		$165/$160
386SX-33MHz		$125/$120
386SX-25MHz		$105/$100

ADD-ON CARDS

	regular/CASH
TVGA-9000 VGA Card w/256K (up to 512K)	$35/$34
TVGA-8900C 1MB Super VGA Card	$60/$59
Diamond SpeedStar-24 1MB VGA Card (16 million colors)	$150/$145
Diamond SpeedStar-24X 1MB VGA Card (16 million colors)	$175/$170
Diamond Stealth 1MB VRAM (S3 chipset & high color)	$215/$210
VESA local bus 1MB SVGA card (16.7 million colors)	$145/$140
VESA local bus 1MB SVGA card (S3 chipset, 16.7 million colors)	$200/$195
EISA IDE cache controller card (4HD/2FD, 512K to 16MB w/OK)	$210/$205
EISA SVGA card with S3 chipset and 1MB VRAM	$310/$305
Super IDE (2HD/2FD with 2s,1p,1g)	$18/$17
Sound Blaster Pro	$145/$140
Promise IDE cache controller card (2HD/2FD, w/512K)	$130/$125
2400 baud internal modem	$40/$39
9600/2400 baud internal fax/modem	$60/$59

MONITORS

	regular/CASH
NEC 21" 6FG N.I. SVGA monitor (0.28 dot pitch, 1280x1024)	$2350/$2299
NEC 17" 5FG N.I. SVGA monitor (0.28 dot pitch, 1280x1024)	$1390/$1340
MGC 14" N.I. SVGA monitor (0.28 dot pitch, 1280x1024, Vesa)	$299/$295
MGC 14" SVGA monitor (0.39 dot pitch, 1024x768)	$230/$225
MGC 15" N.I. SVGA monitor (0.28 dot pitch, 1280x1024, Vesa)	$445/$435
SHAMROCK 14" N.I. SVGA monitor (0.28 dot pitch, 1024x768)	$285/$280
SHAMROCK 14" SVGA monitor (0.28 dot pitch, 1024x768)	$255/$250

FLOPPY & HARD DRIVES

	regular/CASH
Teac 1.2MB 5 ¼" FDD	$60/$57
Teac 1.44MB 3 ½" FDD	$55/$52
170 MB Conner CP-30174 IDE HD (17ms)	$280/$275
120 MB Maxtor MX-7120A IDE HD (15ms, 64K cache)	$255/$250
213 MB Maxtor MX-7213A IDE HD (15ms, 64K cache)	$360/$355
105 MB Seagate 3120A IDE HD (16ms, 32K cache)	$235/$230
250 MB Colorado DJ-20 Tape Backup	$250/$245
Sony internal CD-ROM Drive w/interface	$285/$275

PRINTERS

	regular/CASH
Hewlett Packard Deskjet 500 InkJet printer	$370/$360
Hewlett Packard DeskJet 550C Color InkJet printer	$700/$680
High capacity print cartridge for HP 500 family	$34/$33
Hewlett Packard Laserjet IIP Plus	$760/$740
Hewlett Packard Laserjet IV	$1375/$1350
OkiData OL 400 laser printer	$595/$590
Panasonic KX-P1123 Printer (24pin/240cps/80col)	$195/$190
Panasonic KX-P2123 Quiet Printer (24pin/240cps/80col/color opt)	$258/$250
Color kit for the above printer	$45/$43

KEYBOARDS

	regular/CASH
Acer 6311-G 101 keyboard (click)	$35/$34
Focus 2001 101 keyboard (click, hard dustcover)	$42/$40
Lite-on 4100 101 keyboard (non-click)	$29/$28
KME keymouse 101 keyboard (click, track-ball built-in)	$55/$54

CASES

	regular/CASH
Mini-tower case (200w ps)	$55/$53
Mini-deskstop case (200w ps)	$70/$67
Mid-tower case (230w ps)	$80/$76
Full-tower case (250w ps)	$99/$95

MOUSE/TRACKBALL

	regular/CASH
Genius mouse (200-1000dpi, opto-mechanical)	$20/$19
TrueDox Trackball (50-800dpi, 3 button)	$35/$33
Microsoft serial mouse	$65/$63
Microsoft bus mouse	$75/$73
Logitech First mouse	$50/$49

PARTS & LABOR WARRANTY!

Note: The above prices do not include CA sales tax and/or shipping and handling charges. If any are shown, the regular prices reflect credit card (Visa, Mastercard) and check prices. Cash price reflects guaranteed price for cash purchase. Above price is subject to change without notice.

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Orchid Local Bus

VESA Standard

486DX2-66	$1580.00
486DX-50	$1470.00
486DX-33	$1270.00

Made in USA

- ✧ Orchid 486DX VESA Local Bus M/B
- ✧ 256K High Speed Cache
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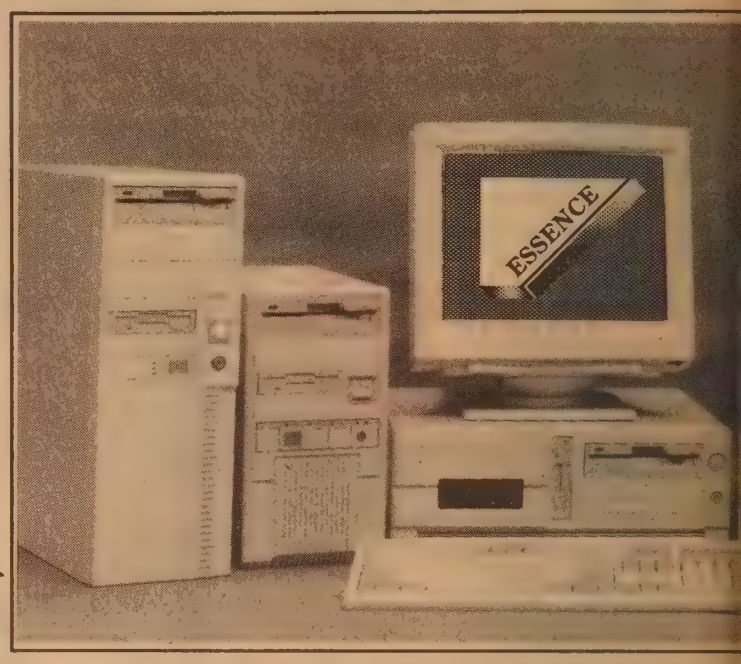
- ✧ 2 Serial / 1 Parallel / 1 Game
- ✧ CS-35 Mid-Veritcal Case
- ✧ 230 Watts UL Power Supply
- ✧ Enhanced 101 Keys Keyboard

VA Options + $40



VESA LOCAL BUS

The Superboard 486 VLB delivers unsurpassed power for even the most demanding applications. The 486 VLB (VESA Local Bus) is an ISA motherboard equipped with two (2) VLB slots for a high performance video card and/or fast IDE controller. It provides the answer to the speed bottleneck caused by traditional AT-compatible motherboard designs. The local bus design provides direct 32-bit data transfer between the video card/IDE controller and the CPU at CPU speed. Pair the Superboard 486 VLB with an Orchid Fahrenheit VA/VLB graphics card, and you'll experience the fastest graphics and motherboard combination possible.

FAHRENHEIT VA.....$209

Made in USA

with system $189

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Non-VA Version also available

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Fax Order Line:
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Made in USA

VEGA VESA Local Bus

VESA 486DX2-66VLB	$1450
VESA 486DX-50VLB	$1350
VESA 486DX-33VLB	$1140

* VEGA 486DX VESA Local Bus M/B
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* TEAC 1.2M & 1.44M FDD
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* 32-Bit VESA Local Bus IDE Controller
* 2 Serial / 1 Parallel / 1 Game
* CS-35 Mid-Vertical Case
* 230 Watts UL Power Supply
* Enhanced 101 Keys Keyboard

Made in USA

VEGA EISA Bus

EISA 486DX2-66VE	$1690
EISA 486DX-50VE	$1590
EISA 486DX-33VE	$1380

* VEGA 486DX EISA M/B
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* 4MB Memory on board expandable up to 128MB
* TEAC 1.2M & 1.44M FDD
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* 32-Bit Orchid IIs-E 1MB EISA VGA Card
* 2 Serial / 1 Parallel / 1 Game
* CS-35 Mini-Vertical Case
* 230 Watts UL Power Supply
* Enhanced 101 Keys Keyboard

Made in USA

VEGA ISA Bus

486DX2-66V	$1240
486DX-50V	$1140
486DX2-50V	$1050
486DX-33V	$920
486SX-25V	$740
386DX-40V	$660
386DX-33V	$645

* VEGA 3486DX ISA M/B
* 256K High Speed Cache
* 4MB Memory on board expandable up to 32MB
* TEAC 1.2M & 1.44M FDD
* 2 Serial / 1 Parallel / 1 Game
* CS-35 Mid-Vertical Case
* 230 Watts UL Power Supply
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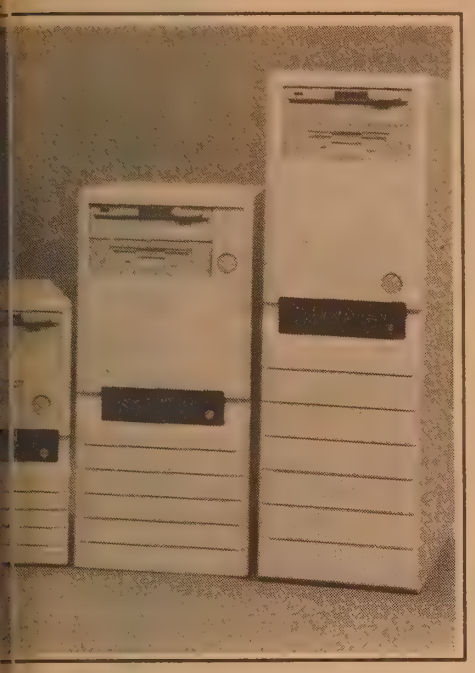
GROUP

Fountain Valley, CA92708



Essence486 VESAEISALocalBus

VESA 486DX2-66HLB $1395
VESA 486DX-33HLB $1080

* HINT 486DX EISA Local Bus M/B
* 256K High Speed Cache
* 3 EISA Bus, 2 VESA Local Bus
* 4MB Memory on board expandable up to 32MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit VESA Local Bus IDE Controller
* 32-Bit 1MB VESA Local Bus VGA Card
* 2 Serial / 1 Parallel / 1 Game
* CS-35 Mid-Vertical Case
* 230 Watts UL Power Supply
* Enhanced 101 Keys Keyboard

Essence486 VESALocalBus

VESA 486DX2-66LB $1350
VESA 486DX-33LB $1030

* VESA Local Bus 486DX M/B
* 256K High Speed Cache
* 4MB Memory on board expandable up to 32MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit VESA Local Bus IDE Controller
* 32-Bit 1MB VESA Local Bus VGA Card
* 2 Serial / 1 Parallel / 1 Game
* CS-35 Mid-Vertical Case
* 230 Watts UL Power Supply
* Enhanced 101 Keys Keyboard

Essence486Series

486DX2-66 ..... $1140
486DX-50 ..... $1030
486DX2-50 ..... $995
486DX-33 ..... $820
486SX-25 ..... $645

* 486DX/SX M/B
* 256K High Speed Cache
* 4MB Memory on board
* TEAC 1.2M & 1.44M FDD
* IDE FDD & HDD Controller
* 2 Serial / 1 Parallel / 1 Game
* CS-932 Mini-Vertical Case
* 230 Watts Power Supply
* Enhanced 101 Keys Keyboard

Essence386Series

386DX-40 ..... $520
386DX-33 ..... $510
386SX-40 ..... $405
386SX-33 ..... $365

* 386DX-40/33 SX-40/35 M/B
* 128K High Speed Cache (16K for SX-40, 0K for SX-33)
* 4MB Memory on board (2MB for 386SX)
* TEAC 1.2M & 1.44M FDD
* IDE FDD & HDD Controller
* 2 Serial / 1 Parallel / 1 Game
* CS-932 Mini-Vertical Case
* 230 Watts Power Supply
* Enhanced 101 Keys Keyboard

Essence486DLC

486-40DLC $690
486-33DLC $645

* 486DLC M/B
* Cyrix 486DLC Microprocessor
* Math Coprocessor included
* 64K High Speed Cache
* 4MB Memory on board
* TEAC 1.2M & 1.44M FDD
* IDE FDD & HDD Controller
* 2 Serial / 1 Parallel / 1 Game
* CS-932 Mini-Vertical Case
* 230 Watts Power Supply
* Enhanced 101 Keys Keyboard

Upgrade Options

For ISA Systems:

14" Mono VGA (Paper-White) Monitor w/AVGA Card (256K) $153
14" AcerView 11 VGA Color Monitor w/16-bit VGA Card (256K) $265
14" AcerView 33D Super VGA Color Monitor (.28dp) w/TVGA-8900C 1MB VGA Card $345
14" AcerView 34T Non-Interlaced Color Monitor w/TVGA-8900C 1MB VGA Card $385
15" AcerView 56L Digital Auto-Tracking Flat-Screen Monitor w/Orchid Fahrenheit 1MB Graphics Accelerator $645
14" CTX-5468NI Non-Interlaced Color Monitor w/TVGA-8900C 1MB VGA Card $375
14" CTX-1461 Digital Auto-Tracking Monitor w/TVGA-8900C 1MB VGA Card $390
w/Orchid ProDesigner IIs 1MB Hi-Color VGA Card ... $470
15" CTX-1560 Digital Auto-Tracking Monitor w/Orchid Fahrenheit 1MB Graphics Accelerator $605
17" CTX-1760 Digital Auto-Tracking Monitor w/Orchid Fahrenheit 1MB Graphics Accelerator $960
14" ViewSonic 6E Non-Interlaced Color Monitor (.28dp) w/TVGA-8900C 1MB VGA Card $385
14" ViewSonic 5E Non-Interlaced Color Monitor (.28dp) w/TVGA-8900C 1MB VGA Card $455
w/Orchid ProDesigner IIs 1MB Hi-Color VGA Card ... $530
15" ViewSonic 6FS Digital Auto-Tracking Flat-Screen Monitor w/Orchid Fahrenheit 1MB Graphics Accelerator $715
17" ViewSonic 7 Digital Auto-Tracking Monitor (.28dp) w/Orchid Fahrenheit 1MB Graphics Accelerator $1145

Hard Disk Subsystem & Other Options (w/Systems):

40MB IDE HDD $150
80MB IDE HDD $200
120MB IDE HDD $250
170MB IDE HDD $285
200MB IDE HDD $350
240MB IDE HDD $395
340MB IDE HDD $575
520MB IDE HDD $855
Promise IDE Caching Controller w/2MB $185
MicroSoft DOS 5.0 ..... $42
MicroSoft Windows 3.1 w/Mouse $63
Internal 2400 Buad Data Modem $32
Internal 9600/2400 Baud Fax Modem $58
Internal 14400/14400 Baud Fax Modem $208
Sony CDU-31A Internal CD-ROM $260
SoundBlaster $95
SoundBlaster Pro (Basic version) $148
Media-Vision Pro Audio Spectrum 16 Sound Card $189
Orchid Sound Producer Pro w/Speaker & Mic .. $159
PowerCenter (UL) $16
NEC CD-Express Multi-Media Package $455
- NEC CDR-25 CD-ROM reader
- 10 interactive CD-ROM software titles
- 1 pair of amplified stereo speakers

For EISA & Local Bus Systems:

ViewSonic 6E 14" Non-Interlaced Monitor $325
ViewSonic 5E 14" Non-Interlaced Monitor $395
ViewSonic 6FS 15" Digital Non-Interlaced Monitor $560
ViewSonic 7 17" Digital Multi-Frequency Monitor $990
ViewSonic 8 20" Digital Multi-Frequency Monitor $1570
CTX-5468NI 14" Non-Interlaced Monitor $315
CTX-1461 14" Non-Interlaced Monitor $335
CTX-1560 15" Digital Non-Interlaced Monitor $450
CTX-1760 17" Digital Non-Interlaced Monitor $805
MAG 15H 15" Non-Interlaced Monitor $565
MAG 17H 17" Digital Non-Interlaced Monitor $1035

Memory Upgrade:

4MB (386SX) $75
8MB (486DX/SX, 386DX) $150
16MB (486DX/SX, 386DX) $480

Tape Backup:

Hi-Lite (Archive) 250MB Tape Backup $215
Colorado DJ-10 120MB Tape Backup $195
Colorado DJ-20 250MB Tape Backup $245
Colorado JT-10 120MB Parallel Tape Backup ... $365
Colorado JT-20 250MB Parallel Tape Backup ... $435

For more parts see listings on next page ➤

Media-Vision Pro16 MultiMediaSystem

MultiMedia Kit included:
Media Vision Pro AudioSpectrum 16 Sound Card
- Stereo sound card with 16-bit recording and playback at 44Khz
- SCSI interface
- Compatible with all major PC sound standard including Sound Blaster for PC Games

NEC MultiMedia SCSI CD-ROM Drive
- Double speed 9300kB/s is ideal for multimedia applications
- Super fast access tim (280ms) is up to three times fas er than other CD-ROM drives

CD package including:
- Carmen Sandiego
- Compton's MultiMedia Encyclopedia
- Lotus 123 MultiMedia
- King's Quest V
- MacroMind Action!
- Nautilus

$899

SoundBlasterPro MultiMediaKit

Starter Kit included:
Creative Labs CD-ROM (Panasonic)
- ✧ High Performance
- ✧ Faster access time of 390ms
- ✧ 64KB Read-ahead buffer

Sound Blaster Pro
- ✧ Best selling sound card in the market

Six CD-Titles
- ✧ MicroSoft Bookself, SB Voice Editor,
- ✧ FM Intelligent Organ, SBTalker,
- ✧ CD-Music Player, MMPlay

$465

OrchidSoundProducer Pro...$179

The Sound Producer Pro is Orchid's entry into the world of sound. The Sound Producer Pro delivers an umparalleled features set while maintaining 100% Sound Blaster Pro compatibility. With 20-voice FM synthesizer and digital sounds, it delivers support for 4 sound standards including Sound Blaster Pro, Ad Lib, Disney sound Source and Covox Speech Thing, and the ability to add Voice Note to any Windows docements created with Windows applications with Object Linking and Embedding (OLE) support. The Sound Producer Pro is guaranted to deliver the bvest quality sound to your favorite games or to business presentations with sampling rates up to 44.1 KHz. The package comes complete with joystick port, MIDI in/out support, stereo microphone input, and speaker at no additional charge.

with system **$159**

For systems see list on front pages

ESSENCE GROUP

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IN ESSENCE, WE ONLY USE QUALITY NETWORK PRODUCTS INCLUDED:

Network Cards: **Eagle, Intel, Accton, 3COM, SMC, Thomas-Conrad**
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Uninterruptiable Power Supply: **American Power Conversion, Tripp-Lite**
Tape Backup: **Colorado Memory System, Maynard/Archive, Mountain, Summit Express, Tecmar, Wangtek**

Novell Certified NetWare Engineer

FILESERVER:
ESSENCE 486DX-33MHz System
- VEGA 486DX-33MHz M/B
- 256K High Speed Cache
- 8MB Memory expandable to 32MB
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- Always IN-2000 SCSI Controller
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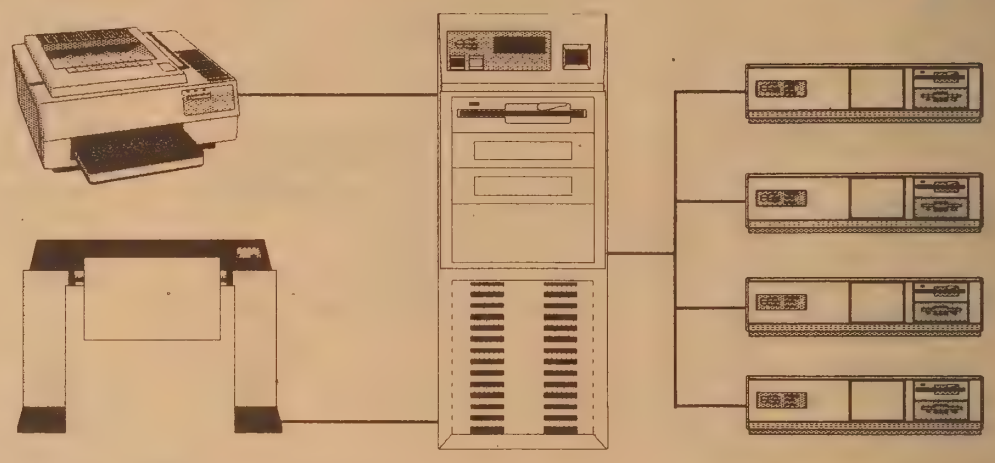
- 12" Monochrome Monitor w/MGP
- 2 Serial / 1 Parallel Ports
- Full size Tower Case w/300Watt PS
- Dual fan for efficient cooling
- Enhanced 101 Keys Keyboard
- Intel EtherExpress 16-bit Ethernet Card
- Pre-loaded with Novell 3.11 Software

5 User Filesever..... $1995.00
10 User Filesever..... $3195.00
20 User Filesever..... $4195.00



Please call for different configurations for Fileserver or workstations.

WorkStation:

ESSENCE 386DX-40MHz System
- 386DX-40MHz M/B w/64K Cache
- 4MB Memory
- TEAC 1.2M & 1.44M FDD
- 14" SuperVGA Monitor w/1MB VGA Card
- 2 Serial / 1 Parallel Ports
- Mini Tower Case w/230Watts PS
- Enhanced 101 Keys Keyboard
- Intel EtherExpress 16-bit Ethernet Card

$1019 per station

ESSENCE 386SX-33MHz System
- 386SX-33MHz M/B
- 2MB Memory
- TEAC 1.2M & 1.44MB FDD
- 14" VGA Monitor w/256K VGA Card
- 2 Serial / 1 Parallel Ports
- Mini Tower Case w/230Watts PS
- Enhanced 101 Keys Keybaord
- Intel EtherExpress 16-bit Ethernet Card

$779 per station

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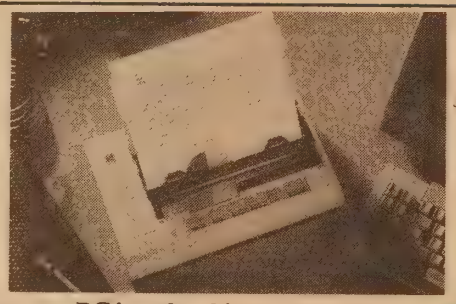

Turn your PC into the ultimate entertainment experience. $489

Fusion CD 16 from Media Vision brings it all together - the power of rich CD sound and realistic 3-D graphics - into an exhilarating learning and entertaining experience. So now you can enjoy all the latest CD-ROM games and educational programs, as well as your favorite music CDs, all on your DOS or Windows based home computer! It's great fun and excitement for the entire family.

A complete value-packed system.

Fusion CD 16 gives everything you need - including high-performance hardware for amazing sound and stunning graphics.

- Fast SONY internal CD-ROM player
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- Plus best-selling CD games and educational programs

How Do You Choose Right Mobile Printer

$395

KODAK DICONIX 701 Printer

"Provides speed and paper handling that no other portable can match."
"Its built-in 30-page cut-sheet feeder makes it the best choice for long-term stays and transportable desktop applicaions"

-- PC Magzine, August 1992

- 30-sheet built-in paper feeder
- 5.6lbs.; 11.7"x7.7"
- 300x300 dpi laser-quality output
- Up to 3 ppm/200cps pint speed at 10cpi
- Whisper-quiet ink-jet operation
- Print portrait or landscape

New Monitors from CTX

CTX-1461 14" Non-Interlaced Monitor
- ❑ 14" .28dp Non-glare screen
- ❑ 1024x768 resolution (Non-interlaced)
- ❑ 72Hz refresh rate @1024 mode

$335

CTX-1560 15" Flat-Screen Monitor
- ❑ 15" .28dp Non-glare flat-square screen
- ❑ 1024x768 resolution (Non-interlaced)
- ❑ 72Hz refresh rate @1024 mode
- ❑ Digital Control
- ❑ IBM PC & Macintosh compatible

$445

CTX-1760DF 17" Flat-Screen Monitor
- ❑ 17" .28dp Non-glare flat-square screen
- ❑ 1280x1024 resolution (Non-Interlaced)
- ❑ Digital Control
- ❑ IBM PC & Macintosh compatible

$795

Order Hot Line: 714/546-3110 ✧ Fax Order Line: 714/546-3803 ✧ Technical Support: 714/546-7902

ESSENCE GROUP

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Order Hot Line: 1-714-546-3110 ✧ Technical Support: 1-714-546-7902 ✧ Fax Order Line: 1-714-546-3803

SYSTEM BOARDS (0K)

VESA Local Bus System Boards (w/CPU)

Orchid 486DX2-66MHz VESA Local Bus M/B w/256K Cache $970.00
Orchid 486DX-50MHz VESA Local Bus M/B w/256K Cache $885.00
Orchid 486DX-33MHz VESA Local Bus M/B w/256K Cache $710.00
VEGA Baby 486DX2-66MHz VESA Local Bus M/B w/256K Cache $850.00
VEGA Baby 486DX-50MHz VESA Local Bus M/B w/256K Cache $765.00
VEGA Baby 486DX-33MHz VESA Local Bus M/B w/256K Cache $580.00
EFAR Baby 486DX2-66MHz VESA Local Bus M/B w/256K Cache $785.00
EFAR Baby 486DX-33MHz VESA Local Bus M/B w/256K Cache $525.00
Hint Baby 486DX2-66MHz EISA VESA Local Bus M/B w/256K Cache .. $830.00
Hint Baby 486DX-33MHz EISA VESA Local Bus M/B w/256K Cache ... $570.00

VESA Local Bus Video Cards & Controllers:

ATi VLB mach 32 VESA Local Bus Accelerator w/2MB $430.00
Genoa 1MB VESA Local Bus VGA Adapter $165.00
Orchid Fahrenheit VESA Local Bus Windows Accelerator w/1MB $195.00
Orchid VESA Local Bus Intelligent IDE Controller (2FDD/2HDD) $64.00
VESA Local Bus IDE with Multi I/O Card $58.00

EISA Bus & EISA Local Bus System Boards (w/CPU)

VEGA Baby 486DX2-66MHz EISA M/B w/256K Cache (USA made) .. $1020.00
VEGA Baby 486DX-50MHz EISA M/B w/256K Cache (USA made) $935.00
VEGA Baby 486DX-33MHz EISA M/B w/256K Cache (USA made) $760.00
OPTI Baby 486DX2-66MHz EISA Local Bus M/B w/256K Cache $970.00
OPTI Baby 486DX-50MHz EISA Local Bus M/B w/256K Cache $885.00
OPTI Baby 486DX-33MHz EISA Local Bus M/B w/256K Cache $710.00
- ET-4000 1MB Local Bus VGA Card (33, 50 or 66MHz) $125.00
- S3 1MB Local Bus Graphics Accelerator (33 or 66MHz) $225.00
- S3 1MB Local Bus Graphics Accelerator (50MHz only) $255.00

ISA Bus System Boards (w/CPU)

VEGA Baby (3)486DX2-66MHz M/B w/256K Cache (USA made) $815.00
VEGA Baby (3)486DX-50MHz M/B w/256K Cache (USA made) $725.00
VEGA Baby (3)486DX2-50MHz M/B w/256K Cache (USA made) $665.00
VEGA Baby (3)486DX-33MHz M/B w/64K Cache (USA made) $515.00
VEGA Baby (3)486SX-25MHz M/B w/64K Cache (USA made) $345.00
VEGA Baby 3(4)86DX-40MHz M/B w/64K Cache (USA made) $260.00
VEGA Baby 3(4)86DX-33MHz M/B w/64K Cac(e (USA -ade) $245.00
OPTI Mini 486DX2-66MHz M/B w/256K Cache (Write-back cache) $770.00
OPTI Mini 486DX-50MHz M/B w/256K Cache (Write-back cache) $685.00
OPTI Mini 486DX2-50MHz M/B w/256K Cache (Write-back cache) $620.00
OPTI Mini 486DX-33MHz M/B w/128K Cache (Write-back cache) $475.00
OPTI Mini 486SX-25MHz M/B w/128K Cache (Write-back cache) $305.00
Symphony Mini 486DX2-66MHz M/B w/256K Cache $770.00
Symphony Mini 486DX-50MHz M/B w/256K Cache $685.00
Symphony Mini 486DX2-50MHz M/B w/256K Cache $620.00
Symphony Mini 486DX-33MHz M/B w/64K Cache $475.00
Symphony Mini 486SX-25MHz M/B w/64K Cache $305.00
UMC Mini 486DLC-40 M/B w/64K Cache (Cyrix 486DLC-40 CPU) $377.00
UMC Mini 486DLC-33 M/B w/64K Cache (Cyrix 486DLC-33 CPU) $317.00
OPTI Mini 386DX-40MHz M/B w/128K Cache (Write-back cache) $206.00
UMC Mini 386DX-40MHz M/B w/128K Cache (Write-back cache) $203.00
OPTI Mini 386DX-33MHz M/B w/128K Cache (AMD CPU) $191.00
UMC Mini 386DX-33MHz M/B w/128K Cache (AMD CPU) $187.00
**** 256K Cache upgrade from 64K for all 486 and 386 M/B $45.00*
**** 256K Cache upgrade from 128K for all 486 and 386 M/B $30.00*
OPTI Mini 386SX-40MHz MB w/16K Cache $155.00
OPTI Mini 386SX-33MHz M/B $130.00
C & T Mini 386SX-25MHz M/B $125.00

ADD-ON BOARDS

Mono/Graphics/Printer Card $15.00
AVGA-1 VGA Card w/256K $27.00
AVGA-3 1MB Graphics Accelerator $72.00
TVGA-9000 VGA Card w/256K (Trident 9000 Chipset,upto 512K) $35.00
TVGA-8900C 1MB SuperVGA Card (Trident 8900C Chipset) $60.00
PVGA-1C VGA Card w/256K (WD90C11 Chipset,upto 512K) $49.00
PVGA-1D SuperVGA Card w/1MB (WD90C30 Chipset) $78.00
PVGA-1DW Graphics Accelerator w/1MB & Hi-Color Chip $118.00
ATi Ultra Plus (1280x1024, 2MB Dram) $330.00
ATi Ultra Pro (1280x1024 Non-Interlaced, 2MB VRam) $430.00
Diamond SpeedStar-24X 1MB VGA Card (16Million colors) $176.00
Diamond Stealth 1MB (VRam) Windows Accelerator $228.00
Orchid Pro-Designer IIs 1MB VGA Card w/Sierra RAMDAC $142.00
Orchid Pro-Designer IIs-E 1MB EISAVGA Card w/Sierra RAMDAC $165.00
Orchid Fahrenheit Windows Accelerator (24-bit, 16.7Mil colors) w/1MB $185.00
Orchid Fahrenheit-VA Windows Accelerator with Voice Annotation w/1MB
- 24bit, 16.7Million colors, 1280x1024, Audio capabilities $225.00

AT I/O (2 Serial 1 Parallel 1Game) Card $14.00
Parallel (Printer) Card $10.00
Game Card (Dual ports) $10.00
AT IDE Adapter (Dual floppy & hard disk) w/Cable $15.00
AT IDE Adapter w/2.88M FDD Controller & Cable $52.00
AT Super IDE IO Adapter (Dual floppy & hard disk, 2S, 1P, 1G) $20.00
GSI 2.88M Four (4) Floppy Controller & Cable $68.00
GSI 2.88M Four (4) Floppy & Intelligent IDE Adapter w/Cable $82.00
Promise IDE Caching Controller (512K,upto 8.5MB,2FD/2HD) $128.00
DTC-2290 EISA IDE Floppy/Hard Disk Contoriler $125.00
DTC-3290 EISA SCSI Caching FD/HD Controller (0K,upto 4MB) $375.00
DTC-3292 EISA SCSI FD/HD Controller $330.00
UltraStor 15C IDE Caching FD/HD Controller w/0MB (upto 8MB) $195.00
UltraStor 14F SCSI FD/HD Controller $228.00
UltraStor 24F EISA SCSI FD/HD Controller $365.00
UltraStor 34F VESA Local Bus SCSI FD/HD Controller $325.00
Future Domain 1670 16-bit SCSI Floppy/Hard Disk Adapter Kit $158.00
Always IN-2000 16-bit SCSI Host Adapter (Novell Certified) $189.00
ADAPTEC AHA-1522BK SCSI Adapter Kit $160.00

MONITORS

AcerView 11 14" VGA Monitor (640x480,.39dp) $238.00
AcerView 33D 14" SuperVGA Color Monitor (1024x768,.28dp) $288.00
AcerView 34T 14" Non-Interlaced Monitor (1024x768,.28dp) $328.00
AcerView 35 14" SuperVGA Monitor (1024x768,.26dp) $460.00
AcerView 56L 15" Multi-Frequency Color Monitor (Flat-Screen, Low radiation, 1280x1024,.28dp, 72Hz refresh rate @1024x768) $490.00
CTX5439A 14" SuperVGA Color Monitor (1024x768,.39dp) $235.00
CTX5468A 14" SuperVGA (TriScan) Color Monitor (1024x768,.28dp) ... $280.00
CTX5468NI 14" Non-Interlaced Color Monitor (1024x768,.28dp) $315.00
CTX1461 14" Non-Interlaced Color Monitor (1024x768, 72Hz refresh) $345.00
CTX1560 15" Non-Interlaced Color Monitor (1024x768,.28dp) $460.00
CTX1760 17" Digital Flat-Screen Color Monitor 91280x1024,.28dp) $825.00
MAG MX-15H 15" Color Monitor (1280x1024,.28dp) $575.00
MAG MX-17H 17" Color Monitor (1280x1024,.28dp) $1055.00
NEC MultiSync 3FGx 15" Color Monitor (1024x768,.28dp) $655.00
NEC MultiSync 4FG 15" Color Monitor (1024x768,.28dp) $765.00
NEC MultiSync 5FG 17" Color Monitor (1280x1024,.28dp) $1315.00
NEC MultiSync 6FG 21" Color Monitor (1280x1024,.28dp) $2350.00
Sony CPD-1304S 14" MultiScan Monitor (Non-Interlaced,.25dp) $598.00
Sony CPD-1604S 17" MultiScan Monitor (Non-Interlaced,.25dp) $995.00
Mini-Micro MM1467L 14" Paper-white MonoVGA Monitor $126.00
ViewSonic 4E 14" SuperVGA Color Monitor (1024x768,.28dp) $295.00
ViewSonic 6 14" Non-Interlaced Color Monitor (1024x768,.28dp) $335.00
ViewSonic 6E 14" Non-Interlaced Color Monitor (1024x768,.28dp) $328.00
Viewsonic 5E 14" Non-Interlaced Color Monitor (1024x768,.28dp 72Hz refresh rate @1024x768) $395.00
ViewSonic 6FS 15" Multi-Frequency Color Monitor (Flat-Screen, Low radiation, 1280x1024,.28dp, 72Hz refresh rate @1024x768) $575.00
ViewSonic 7 17" Multi-Frequency Color Monitor (Digital Auto-Tracking Flat-Screen, Low radiation, 1280x1024,.28dp) $995.00
ViewSonic 8 20" Multi-Frequency Color Monitor (Digital Auto-Tracking Low radiation, 1280x1024,.31dp) $1575.00

FLOPPY & HARD DRIVES

TEAC 1.2MB FDD (5.25") $55.00
TEAC 1.44MB FDD (3.5") w/Mounting Kit $50.00
TEAC 2-in-1 1.2/1.44MB FDD $132.00
TEAC 2.88MB FDD (3.5") w/Mounting Kit $90.00
Conner CP-3000 40MB IDE HDD (29ms) $150.00
Conner CP-30084 80MB IDE HDD (17ms) $205.00
Conner CP-30104 120MB IDE HDD (17ms) $255.00
Conner CP-30174 170MB IDE HDD (17ms) $290.00
Conner CP-30204 210MB IDE HDD (12ms,256K cache buffer) $370.00
Conner CP-30254 251MB IDE HDD (14ms,64K cache buffer) $415.00
Conner CP-3544 520MB IDE HDD (12ms,256K cache buffer) $890.00
Conner CP-3540 520MB SCSI HDD (12ms,256K cache buffer) $890.00
Fujitsu M2624T 520MB IDE HDD (12ms, 5yr warranty) $920.00
Fujitsu M2624FA 520MB SCSI HDD (12ms, 5 yr warranty) $980.00
Fujitsu M2266SA 1.2GB SCSI HDD (12ms, 5yr warranty) $1375.00
Fujitsu M2652S 2.0GB SCSI HDD (12ms, 5yr warranty) $2485.00
Maxtor MX-7120A 120MB IDE HDD (15ms) $255.00
Maxtor MX-7120S 120MB SCSI HDD (15ms) $305.00
Maxtor MX-7213A 213MB IDE HDD (15ms) $370.00
Maxtor MX-7213S 213MB SCSI HDD (15ms) $405.00
Maxtor LXT-340A 340MB IDE HDD (13ms) $580.00
Maxtor LXT-340S 340MB SCSI HDD (13ms) $590.00
Maxtor LXT-535A 520MB IDE HDD (13ms) $880.00
Maxtor LXT-535S 520MB SCSI HDD (13ms) $940.00
Maxtor XT-8760SH 675MB SCSI HDD (16.5ms) $1195.00
Maxtor PO-12 1.2GB SCSI HDD (13ms) $1475.00
Maxtor P1-17S 1.7GB SCSI HDD (13ms) $1675.00
Quantum ProDrive ELS 42MB IDEHDD (19ms) $155.00
Quantum ProDrive ELS 85MB IDE HDD (17ms) $200.00
Quantum ProDrive ELS127MB IDE HDD (17ms) $260.00
Quantum ProDrive ELS 170MB IDE HDD (17ms) $290.00
Seagate ST-351AX 42MB IDE HDD (28ms) $155.00
Seagate ST-3144 130MB IDE HDD (15ms) $265.00
Western Digital AC280 80MB IDE HDD (17ms) $210.00
Western Digital AC2120 120MB IDE HDD (15ms) $275.00
Western Digital AC2170 170MB IDE HDD (14ms) $300.00
Western Digital AC2200 209MB IDE HDD (13ms) $365.00
Western Digital AC2340 340MB IDE HDD (13ms) $580.00
SyQuest SQ555 44MB SCSI Removable Disk Drive $290.00
SyQuest SQ5110 88MB SCSI Removable Disk Drive $345.00
SyQuest SQ400 44MB Cartridge $75.00
SyQuest SQ800 88MB Cartridge $108.00
SyQuest SQ01 SCSI Adapter w/Software $45.00
SyQuest External Kit $115.00
Colorado Memory System JT-10 120MB Parallel Port Tape Backup $395.00
Colorado Memory System JT-20 250MB Parallel Port Tape Backup $450.00
Colorado Memory System DJ-10 120MB Tape Backup $195.00
Colorado Memory System DJ-20 250MB Tape Backup $245.00
Colorado Memory System AB-11 External Adapter Kit $39.00
Colorado Memory System KE-09 External Drive Kit $80.00
Colorado Memory System FC-10 500Kb/s-1Mb/s Adapter Kit $90.00
Colorado Memory System TC-15 Data Compression Adapter Kit $189.00
Summit SE-120 120MB Tape Backup w/PC Tool Backup Software $198.00
Summit SE-250 250MB Tape Backup w/PC Tool Backup Software $253.00
Summit SE-305 305MB IDE Tape Backup w/SummitSafe Software $335.00
3M DC2120 120/250MB Mini Data Cartridge $21.50
Mitsumi CRMC Internal CD-ROM w/Interface (350ms) $225.00
NEC CDR-74 External SCSI CD-ROM/MPC $625.00
NEC CDR-84 Internal SCSI CD-ROM/MPC $560.00
Sony CDU-31A Internal CD-ROM Drive w/Interface $275.00
Sony CDU-535 Internal CD-ROM Drive w/Interface $325.00
Sony CDU-541 Internal SCSI CD-ROM Drive $465.00
Media-Vision CD-16 Multi-Media System w/SONY 31A CD-ROM $495.00

PRINTERS

Citizen 200GX Printer (9pin/213cps/80col/color option) $158.00
Citizen GSX-230 Quiet Printer (24pin/color option) $240.00
Citizen GSX-240 Quiet Printer (24pin/300cps/80col/color option) $305.00
Citizen GSX-145 Printer (24pin/192cps/132col/color option) $365.00
**** Color Kit for Citizen 200GX, GSX-230 or GSX-240 ..... +45.00*
Hewlett Packard DeskJet 500 InkJet Printer $415.00
Hewlett Packard DeskJet 550C Color InkJet Printer $735.00
Hewlett Packard LaserJet IIP Plus Laser Printer $815.00
Hewlett Packard LaserJet IIIP Laser Printer $975.00
Hewlett Packard LaserJet IV Laser Printer $1435.00
NEC SilentWriter Model 95 w/2MB Postscript Printer $1395.00
Panasonic KX-P1123 Printer (24pin/240cps/80col) $193.00
Panasonic KX-P1124i Printer (24pin/300cps/80col) $289.00
Panasonic KX-P2180 Quiet Printer (9pin/240cps/80col/color option) $178.00
Panasonic KX-P2123 Quiet Printer (24pin/240cps/80col/color option) $242.00
Panasonic KX-P2124 Quiet Printer (24pin/320cps/80col/color option) $325.00
Panasonic KX-P2624 Quiet Printer (24pin/300cps/132col) $398.00
**** Color Kit for Panasonic KX-P2180, KX-P2123 or KX-P2124 ..... +45.00*
Panasonic KX-P4410 Laser Printer (5ppm/512K/300dpi) $625.00
Panasonic KX-P4430 Laser Printer (5ppm/1MB/300dpi) $895.00
Okidata OL400P LED Page Printer $598.00
Okidata OL810 LED Page Printer $1048.00
Okidata OL830 LED Page Printer $1278.00
Okidata OL840 Postscript Printer $1598.00
Star NX-1001 Multi-Font Printer (9pin/180cps/80col) $139.00
Star NX-2430 Multi-Font Printer (14pin/240cps/80col) $228.00
Star NX-2420R Rainbow Color Priner (24pin/250cps/80col) $289.00

KEYBOARDS

BTC 5339SX 101keys Keyboard $25.00
Focus-2001 101keys Keyboard w/Hard Dustcover (Click) $42.00
Focus-6000 101keys Keyboard (Soft click) $36.00
Focus-8000 111keys Keyboard (Calculator, Soft click) $46.00
Focus-9000 128keys Keyboard (Programmable, Click) $69.00
Fujitsu-4700 101keys Keyboard $47.00
Honeywell-101WN 101keys Keyboard (3yr. warranty) $40.00
KT-2000 101keys Keyboard (Keytronic made) $42.00
MaxiSwitch 2191 124keys Programmable Keyboard $69.00

CS-20 Baby AT Case w/200W UL P.S. (3x5.25",2x3.5") $84.00
CS-35 Mid Vertical Case w/230W UL P.S. (3x5.25",3x3.5",Digital) $99.00
CS-36 Full Vertical Case w/230W UL P.S. (6x5.25",2HD,Digital) $135.00
CS-300GTS Full Vertical Case w/300W UL P.S. (7x5.25", Double fan) $185.00
CS-510 Baby AT Case w/200W P.S. (3x5.25",1x3.5") $66.00
CS-931 Mini Vertical Case w/230W P.S. (2x5.25",3x3.5",Digital) $65.00
CS-932 Mini Vertical Case w/230W P.S. (2x5.25",3x3.5") $63.00
CS-923 Mid Vertical Case w/230W P.S. (3x5.25",3x3.5",Digital) $92.00
CS-912 Full Vertical Case w/230W UL P.S. (4x5.25",2HD,Digital) $118.00
Diamond Series: (Black color model available +$3.00)
CS-130 Full Vertical Case w/250W UL P.S. (4x5.25",2HD,Digital) $145.00
CS-230 Mid Vertical Case w/250W UL P.S. (4x5.25",2HD,Digital) $135.00
CS-330 Mini Vertical Case w/220W UL P.S. (2x5.25",3x3.5",Digital) $86.00
CS-530 Desktop Case w/250W UL P.S. (2x5.25",2x3.5",2HD,Digital) $98.00
CS-730 Baby AT Case w/220W UL P.S. (2x5.25",1x3.5,1HD,Digital) $90.00
CS-830 Slim Line Case w/220W UL P.S. (1x5.25",1x3.5",1HD,Digital) $89.00
2nd Fan for Diamond Series cases (CS-130,CS-230,CS-530) $10.00

MISCELLANEOUS

Honeywell 3-buttom Serial Mouse $45.00
Logitech Dexxa Mouse $24.00
Logitech Bus MouseMan $68.00
Logitech PS-2/Serial Combo MouseMan $68.00
Logitech Trackman II (Serial) $84.00
Logitech Trackman Portable $105.00
MicroSoft Serial Mouse $78.00
MicroSoft Bus Mouse $90.00
MicroSoft BallPoint Mouse for Notebook computer $105.00
Intel SatisFAXtion model 100 Internal Fax Modem $105.00
Intel SatisFAXtion model 200 Internal Fax Modem $305.00
Intel SatisFAXtion model 400 Internal Fax Modem $415.00
Intel SatisFAXtion modem 400 External Fax Modem $455.00
U.S. Robotics Sportster 9600PC Internal Data Modem $289.00
U.S. Robotics Sportster 9600 External Modem $342.00
U.S. Robotics Sportster 14400/9600 Internal Data/Fax Modem $348.00
U.S. Robotics Sportster 14400/9600 External Data/Fax Modem $385.00
Zoltrix 2400i Internal 2400Baud Data Modem $36.00
Zoltrix Standard Internal 9600SR/2400 Send/Receive Fax/Data Modem $62.00
Zoltrix Standard Internal 9600SR/2400 Send/Receive Fax/Data Modem -w/BitFax for Windows $64.00
Zoltrix Enhanced Internal 9600SR/2400 Send/Receive Fax/Data Modem - with Hardware MNP5 & V.42bis $96.00
Zoltrix Pocket 9600SR/2400 Send/Receive Fax/Data Modem $120.00
Zoltrix 9600/9600bps Inernal V.32/V.42bis/MNP5 Data/Fax Modem $198.00
Zoltrix 14400/14400bps Internal V.32/V.42bis/MNP5 Data/Fax Modem $218.00
Zoltrix 14400/14400bps External V.32/V.42bis/MNP5 Data/Fax Modem $248.00
Aceex 9600bps Internal V.32/V.42bis/MNP5 Data Modem $195.00
Aceex 9600bps External V.32/V.42bis/MNP5 Data Modem $215.00
Accex 14400/9600SR Internal Data/Fax Modem $235.00
Aceex 14400/9600SR External Data/Fax Modem $260.00
Cyrix 83X87-16 / IIT 3C87SX-16 Math Coprocessor ..... $78.00 / $72.00
Cyrix 83X87-25 / IIT 3C87SX-25 Math Coprocessor ..... $82.00 / $75.00
Cyrix 83D87-25 / IIT 3C87DX-25 Math Coprocessor ..... $88.00 / $80.00
Cyrix 83D87-33 / IIT 3C87DX-33 Math Coprocessor ..... $92.00 / $84.00
Cyrix 83D87-40 / IIT 3C87DX-40 Math Coprocessor ..... $108.00 / $99.00
Intel 387SX Math Coprocessor $85.00

For systems see list on front pages

Continued from page 132

RESOURCES

Calendar Of Events continued

February 22–March 16 Lotus 1-2-3 Intensive Class. Monrovia. The Organizers. Call: (818)303-3311.

February 23 Moving Up To Lotus 1-2-3 For Windows Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 24–March 18 WordPerfect 5.1 Intensive Class. Monrovia. The Organizers. Call: (818)303-3311.

February 26 Beginning Ami Pro Class. Burbank. Unique Learning Centers. Call: (818)843-8119.

February 27 DOS Class. Monrovia. The Organizers. Call: (818)303-3311.

FEBRUARY 13

CALIFORNIA COMPUTER SHOW & SALE

California State University Northridge, North Campus

The Richard James Corp. Computer Show & Sale, at CSUN January 13, will feature software, computer books, IBM compatible hardware, and many other computer products and accessories from dealers, direct importers, and manufacturers. Admission is $6.00 and shows run from 10 am–4 pm. Call: 1-800-685-1400.

February 27 Intro To The IBM Class. Monrovia. The Organizers. Call: (818)303-3311.

MARCH

March 4–5 Data Communications Class—Understanding The Basics. Los Angeles. Center for Advanced Professional Development. Call: (714)261-0240.

March 7&14 QuickBooks Class. Monrovia. The Organizers. Call: (818)303-3311.

March 13 Intermediate WordPerfect 5.1 Class. Monrovia. The Organizers. Call: (818)303-3311.

March 15–17 Virtual Interface Technology Course. Los Angeles. UCLA Extension. Call: (310)825-1047.

March 18–19 Optimizing NetWare Class. Los Angeles. Center for Advanced Professional Development. Call: (714)261-0240.

March 20 DOS Class. Monrovia. The Organizers. Call: (818)303-3311.

March 20 Windows 3.1 Class. Monrovia. The Organizers. Call: (818)303-3311.

March 27 Advanced WordPerfect 5.1 Class. Monrovia. The Organizers. Call: (818)303-3311. ■

MARCH 1–3

SECOND ANNUAL WINDOWS HARDWARE ENGINEERING CONFERENCE

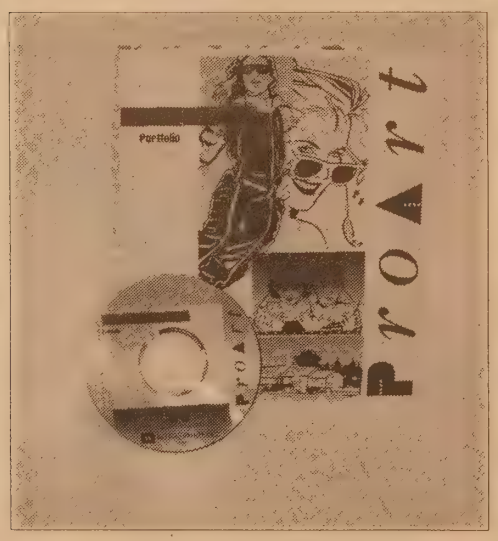
San Jose

Designed for engineers, not marketers or salespeople, the focus of the 1993 Windows Hardware Engineering Conference is to help you build better systems. Three days of in-depth breakouts, presented by leading vendors, will begin with opening sessions providing an overview of the technology and implementation process in seven key areas. The conference features: focused technical presentations, specific proposals to advance ease of use, sixty detailed breakout sessions, sample designs, exhibition by component vendors, and interaction with industry leaders. Sponsored by Microsoft. For information and registration, call: 1-800-421-6338.

PRODUCT SPOTLIGHT

Continued from page 102

CD-ROM is a collection of clip art in EPS format. The CD contains over three thousand pieces of art in more than fifty different categories. All of the art is line art, there is no



color art included. The collection is indexed via Multi-Ad's Search program, in my opinion the best indexing and retrieval system for graphics on the Mac. The CD includes a run-time version of Search. It lets you search for the right piece of art via keywords, provides a quick thumbnail preview of each piece of art, and can display any piece of art full-size.

System requirements are minimal—CD-ROM drive and 2MB of memory. The artwork is very traditional, almost antique in nature. While it won't win any awards for being chic, the contents are serviceable for most applications. The price is a bit high compared to other clip art collections on the market, but the added value of being pre-index via Search may make the additional cost worthwhile. (Multi-Ad Services, 1720 W. Detweiller Dr., Peoria, IL 61615. 1-800-447-1950)

VERBUM INTERACTIVE CD-ROM MULTIMEDIA MAGAZINE ISSUE 1.0 MAC EDITION

Published By: Verbum
List Price: $49.95
Reviewed By: Matthew Leeds

There are certain products that become icons: lava lamps, PEZ dispensers, metal vegetable steamers, Corvette Stingrays. Some are functional, some not, some affordable, some not. They mark a point in time and in technology. The Verbum Interactive CD-ROM is such a product. It is both troublesome and seminal.

It is troublesome because only a few will be able to afford the hardware required to use it. You need a color Mac with a late-model CD-ROM drive, at least 5MB of memory (and 8MB if you want to see everything), a pair of external speakers, and at least System 6.0.7. It is also troublesome if you accept its definition as a magazine since its development was funded in part by outside parties, and the advertisements are not clearly labeled as such.

It is seminal because it pushes the boundaries of multimedia products. There has been lots of discussion of the potential of interactive multimedia technology, but Verbum Interactive delivers. The tutorial on Photoshop is an excellent example of computer-assisted learning, the interactive feature stories on cyberculture and multimedia marketing have an impact that a story in a print magazine or on television could never deliver.

This stuff still has a long way to go. "Reading" Verbum Interactive requires lots of patience as there are long delays each time a new segment is loaded from CD-ROM. The occasional excesses of artistic expression may distract you as they did me, but one person's excess is another person's pleasure. Verbum plans to offer a quarterly subscription service with versions for MS-DOS/Windows, CDTV, and CD-I to follow. (Verbum, 670 Seventh Ave., 2nd Fl., San Diego, CA 92101. 617/233-9977) ■

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BULLETIN BOARDS

RESOURCE LISTING CHANGES

As electronic bulletin boards continue growing, system operators are adding phone lines that include additional area codes. Beginning with issue #100, *MicroTimes* introduced a "Multi-Zone" category for BBSes with access phone numbers in multiple area codes.

Thank you,
MicroTimes staff

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AOS—Avatar Online Systems. (213)888-2362, (714)524-8996, (818)969-8BBS. 8-N-1. 32 lines, chat, games, tutors, etc. Free trial, 10% discount when referring to *MicroTimes* on application. Sysop: Nancy J. Teppler. [Exp. #105.]

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Blazin' Bytes BBS. (310)641-4678, (818)776-2784. 8-N-1. Sixteen lines, chat, email, games, sixty pubs/SIGs, great library. Free month. Sysop: Blazin' Barb. [Exp. #107.]

Crystal Palace. (310)472-2598, (818)765-2171. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. 15GB of GIFs, stories and shareware on CD-ROM, netmail, active msg database, matchmaker, doors, games. Sysop: Daniel Mathis. [Exp. #106.]

Entertainment & Consumers Network. (310)204-6007, (818)784-3039, 888-3942. 8-N-1, 24 hrs., 300/1200/2400. Over fifty consumer and business services available with free trial membership. [Exp. #106.]

Infinite Wisdom North. (213)664-4231, (818)951-2796, 951-6097. 8-N-1, 24 hrs., 1200/2400. Educational science, engineering, online games, doors, chat, offline mail reads. Free trial account. Sysop: Tom Honles. [Exp. #106.]

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213

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LAAUGLine. (213)387-1002. 24 hrs., 300/1200/2400. Amiga. Sysop: Thom Irwin. [Exp. #106.]

Megabytes BBS. (213)221-6379. 8-N-1, 300/1200/2400. Specializing in Windows 3.x shareware. Sysop: William Rivas. [Exp. #105.]

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Continued

BBS SPOTLIGHT

By John Wolcott

APPLY PC APPLICATIONS

The PC Applications BBS comes to you direct from Costa Mesa, California. While not offering multiple toll-free foreign exchange telephone lines, the subscription price is right. Free! That's right, free! Last month's BBS spotlight made mention of the illusive full-featured BBS that has no subscription fee. This month's article focuses on just such a BBS that's packed with features. Although you won't find multiline live chat forums, the BBS enthusiast who doesn't require this luxury will find plenty of terrific BBS entertainment on PC Applications.

System Operator Dave Robinson provides the BBS as a hobby. Dave started his bulletin board five years ago, offering a single phone line at 2400 baud. At that time, there were only about three hundred files available for download. His system has grown considerably—there are three phone lines on three networked computer systems. Available now is a staggering selection of 17,500+ files occupying 1.7GB of disk space.

PC Applications BBS runs on Wildcat v3.55 software that offers easy access to system features. The available baud rates are nothing to sneeze at. The system supports 14,400 baud and is downwardly compatible to 1200 baud. It's very refreshing to download files at a faster rate than the 2400 baud most BBSes offer.

If you've been promising yourself, "one of these days I'm going to actually try out that modem thing I bought," this is a great place to start. System prompts will guide you through logging on, after which the system will automatically call your computer back for telephone number verification. The next time you log in, full system access will be yours. Are you tired of reading system bulletins every time you log on? No problem. Typing "*" before your name and after your password will take you directly to the main menu. Security levels on the system relate, basically, to the daily time you're allowed on the system. Higher security levels (more time) are allotted to those who use the message bases, hold an FCC issued Amateur Radio license, or upload files.

The main system menu will direct you to the features available. They include an extensive message area with the ability to join any or all of 220 conference forums. You'll also find a review of system statistics, a PC Applications online newsletter with the latest breaking system news, a files menu, and "Doors." You can even view who is on the other system nodes and chat online with them. If you need more help, information is available from the main menu or you may leave Dave a message with any questions you may have. Expect a prompt and friendly reply.

The conference forums contain just about every topic imaginable. Messages can be sent to other system users and can also be forwarded to users of Wildnet, Uninet, and PCnet; which are other message-based systems. Receipt of your messages can be done online or messages can be downloaded and read at your leisure. Since this is a "family" bulletin board, message bases are automatically scanned twice daily to omit profanity.

System statistics are impressive, with the nodes being supported by 386 PC systems and US Robotics HST modems. The system operator is continually in the process of upgrading both software and hardware as it becomes available.

The file menu allows your choice of downloads from sixty-five file categories. You'll find more public domain and shareware files than you could ever possibly use. Selecting files for download is easier than ever, allowing you to tag files displayed by choosing a corresponding file number; without ever typing in a file name. The system supports most download protocols including ZModem, which is by far the

Continued on page 147

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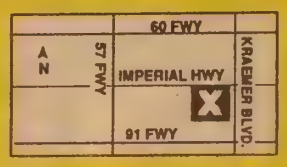

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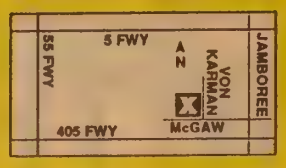

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Continued from page 142

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Vextrec 101 key Enhanced Keyboard (compact size) $25
BTC 7000 101 Key Enhanced Keyboard (Soft Touch) $27
Mitsumi 99YC 101 key Enhanced Keyboard $25
Maxi-switch 101 key Enhanced Keyboard $35
Focus 2001 101 key click Enhanced Keyboard $37
Focus 9000 Programmable Keyboard $62
Fujitsu 4700 101 key Enhanced Keyboard $45
Ortek 142 Key Programmable Keyboard w/8KB Buffer + Battery $75
A4 Serial MS Comp Mouse, Dynamic Hi RES $18
Logitech Serial Mouseman $60
Logitech Bus Mouseman $70
Logitech PS/2 Serial Mouseman $70
Microsoft(OEM) Serial Mouse $55
Microsoft(OEM) Bus Mouse $75
Logitech Trackman Serial $90
Logitech Trackman Portable $110
Microsoft Ballpoint Mouse for Notebook $110

Multimedia And CD-ROM Drives:

Multimedia Soundset 1, includes Sound Blaster Pro Board, 2 MPC titles (Chessmaster 3000/Wing CMDR/ Ultima VI), 8 Sound Utilities and Manuals $175
Multimedia Soundset 2, 2 MPC titles (World Atlas/Wing CMDR/Ultima VI), others same as Soundset 1 ..... $175
Multimedia Soundset 3, 2 MPC titles (World Atlas/Chess Master 3000), others same as Soundset 1 ..... $175
Multimedia Upgrade Kit 1, includes Sony CDR-535 Internal CD-ROM Drive Pak, Sound Blaster Pro Board, 5 CD titles on 2 discs: Multimedia Encyclopedia 92, US Atlas, World Atlas, Chessmaster 3000, & Mavis Beacon Teaches Typing, and cables/manuals $495
Multimedia Upgrade Kit 2, 2 more CD titles: MicroSoft Bookshelf and Works, others same as Kit 1 ..... $635
Multimedia Upgrade Kit 3, includes Sony CDR-535 CD-ROM Pak, Audio Spectrum Pro Board, 5 CD titles Manuals/Cables $535
Sony CDU 31A AT interface Internal CD-ROM Drive and 5 Pak CD Bundles: Encyclopedia 92, Reference Library 2.0 Book of Mammals, US/World Atlas, CD Game Pack II $365
Sony CDR 535 AT Interface Internal CD-ROM Drive and 5 Pak CD Bundles $415
Sony CDR 535 AT Interface External CD-ROM Drive and 5 Pak CD Bundles $495
Mitsumi Internal CD ROM w/Sound Blaster Pro and 5 CD Titles $460

Monitors:

MGC1441 14" VGA 640x480 .41mm $210
MGC1439 14" SVGA 1024x768 .39mm $225
CTX5468A 14" SVGA 1024x768 .28mm $270
CTX5468NI 14" SVGA 1024x768 .28mm NI $299
CTX 1460 14" SVGA 1280 x 1024 .28mm NI, 72Hz at 1024 x 768, Edge to Edge Display, Digital Display $380
CTX 1461 14" SVGA 1280 x 1024 .28mm NI, 72Hz at 1024 x 768 Edge to Edge Display, NEC Tube $335
CTX 1760 17" SVGA 1280 x 1024 .28mm NI, 72Hz at 1024 x 768 ..... $895
MAG 14" SVGA 1024 x 768 .28mm 72Hz at 800 x 600 ..... $345
MAG 15" SVGA 1280 x 1024 .28mm NI 72Hz at 1024 x 768 ..... $595
MAG 17" SVGA 1280 X 1024 .28mm NI 72Hz at 1024 x 768 ..... $1095
VIEWSONIC6E 14" SVGA 1280 x 1024 .28mm NI $325
VIEWSONICSE 14" SVGA 1280 x 1024 .28mm 72Hz at 1024 x 768 ..... $395
VIEWSONIC5+ 14" SVGA 1280 x 1024 .25mm 72Hz at 1024 x 768 ..... $495
VIEWSONIC6FS 15" Flat-Screen LR 1280 x 1024 72Hz at 1024 x 768 ..... $575
VIEWSONIC7 17" SVGA 1280 x 1024 .28mm NI, 72Hz at 1024 x 768 ..... $995
VIEWSONIC8 20" SVGA 1280 x 1024 .31mm NI, LR, FS $1550

Chassis And Power Supplies:

BabyAT Case w/200 Watt UL P.S. $78
BabyAT2 Case w/200 Watt UL P.S., 5 Bays, Digital Display $85
SlimAT Case w/200 Watt UL P.S., 3 Bays, Digital Display $85
TowerM Medium Case w/200 Watt UL P.S. $78
TowerM3 MiniCase w/200 Watt UL P.S. and extra fan ... $95
TowerM2 Medium Case w/200 Watt UL P.S. $85
Tower Fullsize Tower Case w/230 Watt UL P.S. $115
Tower2 Fullsize Tower Case w/230 Watt UL P.S. w/Dust Cover $145
Tower3 Fullsize Tower Case w/230 Watt UL P.S. w/ Dust Cover $130
BabyAT Case w/200 Watt P.S. $70
BabyAT2 Case w/200 Watt P.S. $80
TowerB Mini Tower Case w/200 Watt P.S. $53
TowerM Medium Tower Case w/200 Watt P.S. $65
TowerM2 Medium Tower Case w/200 Watt P.S. w/Dust Cover $80
Tower Fullsize Tower Case w/230 Watt P.S. $105
Black Color Available, Extra Charge
MiniAT 200 Watt P.S. UL Approved $45
MiniAT 200 Watt P.S. $35
FullAT Tower 250 Watt P.S. UL Approved $52
FullAT Tower 250 Watt P.S. $42
UPS American Power 450VA Backup $215

Mathcoprocessors And RAMs:

Cyrix 80387 40Mhz Math CoProcessor $95
Cyrix 80387 33Mhz Math CoProcessor $90
Cyrix 80387SX 33/25MHz Math Coprocessor $75
1MBx3 70ns SIMM (Major Brands) $35
4MBx3 60ns SIMM (Major Brands) $130

Network Interface Cards:

EN3360 16 Bit Ethernet Coax NE2000 Compatible $110
EN3360 16 Bit Ethernet 10 Base T NE2000 Compatible $145

ATLANTIC COMPUTER SYSTEMS

376 Lemon Creek Drive, Unit F, Walnut, CA 91789
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Tel: (818) 998-1988 Fax: (818) 998-6558
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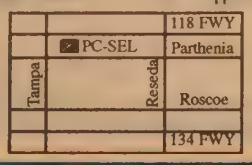

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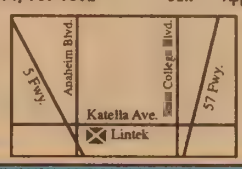

BBSes

ers. Help files, email, up/downloading, no fee. [Exp. #107.]

Diaspar Virtual Reality Network. (714)831-9101 (2400), 362-9995 (9600). Home EduTainment Center, 20+ lines, experience virtual reality. Sysop: David Mitchell. [Exp. #106.]

The Drop Zone! BBS. (714)245-3854. Games, utilities, adult GIFs, nationwide echo-net, 1.2GB online. Reg required. Sysop: Rick Simmons. [Exp. #106.]

Easy Street. (714)590-4307, 778-5473. 8-N-1, 24 hrs., 300/1200/2400/9600. 20,000+ files, adult fun, 42 lines w/local access throughout Orange County. [Exp. #106.]

ExecuClub BBS. (714)640-1950. CD-ROM, GeoWorks, Windows, FaxDepot, Business, MatchMaker. [Exp. #105.]

The Hotline BBS. (714)857-0233, 256-8672. 8-N-1, 24 hrs., 300/1200/2400. PD software, matchmaking, 16 chat lines, social events. Sysop: John Coon. [Exp. #105.]

Infinity BBS. (714)379-1335. 16 lines, one GIF file library, teleconference, games, email, and current satellite weather pics. Sysop: Eric Robitaille. [Exp. #105.]

The Master Connection BBS. (714)651-9815. 24 hrs., 1200/2400/9600. Lots of games, utilities, graphics. No fee. Sysop: Mark Duvall, Jr. [Exp. #106.]

Online Exchange. (714)870-4614. 2400–14,400. Shareware, large adult GIF file area, games, 2.5GB online. Sysop: Bob Aune. [Exp. #105.]

PC-Applications BBS. (714)432-9104, 557-8351, 557-6688. 24 hrs., 1200–14,400. Online games, email, echo-mail, over 300 conferences. Full access on first call with call back verifier. Sysop: Dave Robinson. [Exp. #106.]

The PC Sports Connection. (714)533-6728. 8-N-1, 24 hrs., 300/1200/2400. Using Searchlight for unique games, fantasy leagues, and sports talk. Sysop: Keith Jefferson. [Exp. #105.]

Sherlocktron. (714)492-0724. 8-N-1, 24 hrs., 2400. Sherlock Holmes BBS with lists of societies, publications, and purveyors. Sysop: Willis G. Frick. [Exp. #106.].

SOCCC BBS. (714)373-0964. 24 hrs. Public domain & shareware for IBM, Apple & CP/M. Sysop: Brian A. Fliege. [Exp. #106.]

Trixie's Doghouse. (714)499-2864. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. Specializing in topics related to pets. Full access with callback. Sysop: Jason MacDonald. [Exp. #107.]

Viewlink BBS. (714)650-4612. 24 hrs., 1200/2400/9600. Singles dating service featuring GIF pictures. Marketplace with GIFs of items for sale. Sysop: Terry Andrews. [Exp. #106.]

WinSIG BBS. (714)363-9802. 24 hrs., Windows 3.xx shareware. Sysop: Firas Bushnaq. [Exp. #105.]

805

The Brainstorm BBS. (805)584-6088. Multiline, online games, file library, dating, chat. [Exp. #106.]

The Farpoint BBS. (805)582-1621. 1200/2400/9600/14,400. IBM files, GIFs, WILDnet, THROBnet, SwingNET. Member of United Sysops Assoc. Sysop: Gary Bisner. [Exp. #107.]

Mount Olympus BBS. (805)297-5787. 24 hrs., 2400–38,400. Adult (21+), 1GB of high-quality adult-only files. No post-to-call ratio. New users get five days free d/l's. [Exp. #107.]

818

AABBS (Asia America BBS). (818)284-4519. 24 hrs., 300/1200/2400/9600/14,400. Specialize in bridging the gap between Asian and American cultures, with a special focus on business. [Exp. #107.]

African American BBS! (818)793-9155. P-Funk online, sports, issues, health, business. Check it out. Free. Sysop: Jeffery Mitchell. [Exp. #107.]

Americom. (818)967-3108. 10 pm–8 am. Laserdisc! Video, file, radio communications, soundtrack info, and the arts. Using standard QWK offline mail system. [Exp. #107.]

Aussie BBS. (818)337-9701. 8-N-1. 10 lines, chat, games, high-quality adult GIFs, 18,000 files. Sysop: Mike Szabados. [Exp. #106.]

Chatterbox! BBS. (818)995-6959. 8-N-1, 24 hrs., 2400/9600/14,400. All adult, GIFs, shareware, freeware, multiline chat, library, games, and CD-ROMs. Sysop: Don Adler. [Exp. #106.]

Gifshopper BBS. (818)989-0975. 2400/9600/14,400. An adult-oriented BBS featuring The Giffshoppe Goodies Collection with over 4.5GB online. Sysop: Dan Bauer. [Exp. #106.]

Hoptips BBS, Glendale. (818)248-3088. 122/9600/14,400. 5 lines serving the needs of the professional; extensive coverage of the office environment; 1-2-3 and WordPerfect conferences. RIME network. Sysop: Mike Callaghan. [Exp. #105.]

INFOmania BBS. (818)791-8680. 8-N-1, 24 hrs., 300–14,400. Fidonet, Racenet, and Business-net conferences, DOS utilities. Free access on first call. [Exp. #107.]

InvestorLink. (818)960-9362. 24 hrs., 2400. Financial stocks, Real Estate, Mutual Funds, daily updates. Free. Sysop: Steve Painter. [Exp. #105.]

Mysteria. (818)353-8891. 300–14,400. Metaphysics and general. Fidonet. Free. Sysop: Phil Hansford. [Exp. #106.]

PC Solutions BBS. (818)776-2397. 9600. Fidonet, all the latest warez, games, utils. Free. [Exp. #106.]

The Rogue's Guild. (818)347-4291. 16,800. Fidonet, lrg file and message sections. US Robotics Dual Standard 16.8K. [Exp. #106.]

Sahara Club. (818)893-1899. 8-N-1, 1200/2400. Off-road, timber, guns, and more. Fidonet, free. Sysop: Patrick Martin. [Exp. #106.]

Software Bank. (818)993-5516. 2400/9600/14,400. OS/2, Windows, Star Trek Fidonet echos, QWK mail, 13,000 files for D/L. Free. [Exp. #106.]

Southland Matchmaker. (818)793-9108. Pen-pal system, multilines, chat, games. Enter "mm" at login prompt. [Exp. #106.]

Tin Shack BBS. (818)992-3321. Over 1GB of free downloads, immediate access, multiline. Sysop: Guy Nohrenberg. [Exp. #105.]

Tri-City Apple BBS. (818)288-6540. 8-N-1, 24 hrs., 2400. Mostly Apple II, email, PD, UL/DL. [Exp. #105.]

20th Century BBS. (818)305-8300. 8-N-1, 24 hrs., 300/1200/2400. Multiline, chat, email, SIGs, databases, new user help. Sysop: Steve Aranyi. [Exp. #105.]

Valley Apple Computer BBS. (818)782-6471., 300/1200/2400. Friendly to beginners, uploading and downloading Apple II only. [Exp. #106.]

Wizardry BBS. (818)222-4444. 1200/4800/9600/14,400. Chat, games, U/L, D/L, mulitline. Free. [Exp. #107.]

916

Video ViSion BBS. (916)682-1655. 24 hrs., 300/1200/2400/9600. Games, graphics, Windows & source code. 360MB. Sysop: Roel Sarceno. [Exp. #105.]

Continued

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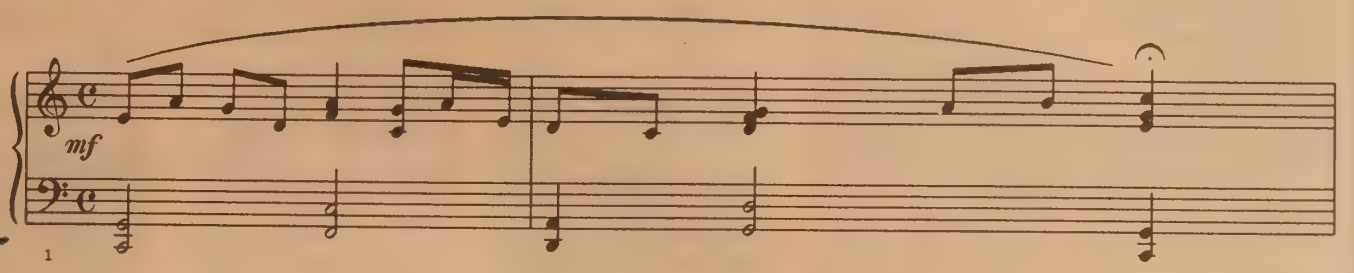

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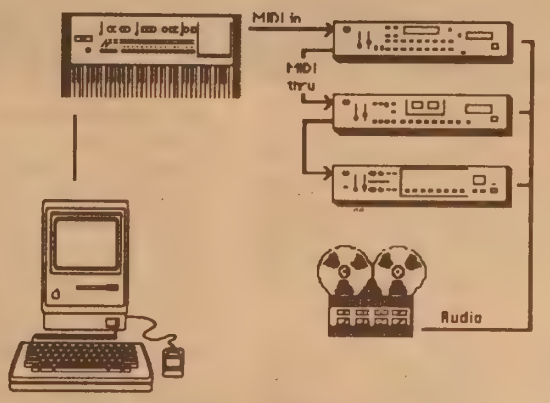

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ASSOCIATIONS

Black Data Processing Assoc., LA Chapter. Meetings: 4th Tues., 6:30 pm, ULTC, 7266 S. Figueroa St., Los Angeles. Call: (310)673-6522, 1-800-727-BDPA. [Exp. #107.]

Data Processing Management Association. Meetings: 2nd Thurs., 7:00 pm. An organization composed of all levels of management personnel who have an interest in the field of information processing. Call: (310)549-9680 or (213)225-9210. [Exp. #105.]

Independent Computer Consultants Association, Los Angeles Chapter. Meetings: 1st Thurs., 6:00 pm. Prepaid reservation, $25, or at the door, $35. The LA chapter provides referral services. Call: (213)872-1811. [Exp. #110.]

Microcomputer Managers Association, Los Angeles Chapter. A forum for the discussion of issues relating to implementing and supporting microcomputer technology. Call: (213)243-6843. [Exp. #104.]

Orange County Association Of PICK Professionals. Meetings: 3rd Wed., 6:00 pm, Claim Jumper Restaurant, 18350 Brookhurst St., Fountain Valley. Dinner: Members, $20; nonmembers, $25. Without reservations add $5 additional. Call: (714)641-6347. [Exp. #110.]

The Software Council Of Southern California (SCSC). Non-profit organization for software developers to have a (peer-to-peer) networking and educational forum on industry issues. Call: (310)328-0043. [Exp. #110.]

USER GROUPS

ACCOUNTING

Orange County ACCPAC Plus Accounting Software User Group. Meetings: 3rd Mon., 6:00 pm. Call: (714)535-5417. [Exp. #107.]

ADAM

Inland Empire Adam User Group. Meetings: 3rd Sat., 12:30 pm, Anaheim Public Library, 1340 S. Euclid. Since 1986, LA and Orange Ccunties' only group and newsletter for the Coleco Adam. Call: Tom, (714)538-6254. [Exp. #105.]

AMIGA

LAAUG—Los Angeles Amiga User Group. Meetings: 3rd Wed., 7:30 pm, Veteran's Memorial Auditorium, Overland Ave. & Culver Blvd. Many SIGs, rookies, monthly PD disks. Call: Kip Hammond, (310)390-3010. [Exp. #105.]

San Fernando Valley Amiga User Group. Meetings: 2nd Tues., 7:00 pm, Meeting Room, Fallbrook Mall. Call: Tony, (818)985-0476. [Exp. #105.]

South Orange Commodore Klub—SOCK. Meetings: 3rd Sat., 9:00 am, Computer Guild, Suite 1003, 24001 Via Fabricante, Mission Viejo. Supports Commodore and Amiga, new users SIG. Call: Don, (714)830-2430. [Exp. #109.]

APPLE

Orange Apple Computer Club. Meetings: 1st Sat., 9:00 am, Orange Coast College, Chemistry Lab. Apple II supported. Call: (714)731-9243. [Exp. #106.]

Original Apple Corps, Apple II User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #107.]

Tri-City Apple Users Group. Meetings: 3rd Thurs., 7:00 pm, Pasadena Central Library, 285 E. Walnut St. Friendly Apple II experts. Call: (213)258-0281. [Exp. #106.]

Valley Apple Computer Club. Meetings: 3rd Tues., 7:30 pm. Aggeler High School, 21050 Plummer, Northridge. All Apple IIs, no Macs. Call: Bill, (818)988-1752. [Exp. #106.]

ATARI

ATESIG—Atari 8-Bit SIG. Meetings: 145 Surf Pl., Seal Beach. Cooperative user group for Model Railroad applications. Call: (310)430-5433. [Exp. #107.]

R.A.M. Atari User Group Of Ventura County. Meetings: 3rd Wed., 7:30 pm, Write: PO Box 112, Camarillo, CA 93011. Call: Tim, (805)389-0059. [Exp. #110.]

South Bay Atari Computer Enthusiasts. Meetings: 2nd Tues., 7:30 pm, Lomita VFW Hall, 1865 W. Lomita Blvd. Active since 1985, novices & all skills welcome. Call: (310)375-4839. [Exp. #105.]

CAD/CAM

Los Angeles Area AutoCAD User Group. Meetings: 4th Wed., 6:30 pm, Burbank Board of Realtor's Bldg., 2006 W. Magnolia Blvd., Burbank. Meetings feature tutorials, Q&As, demos, hands-on, BBS, and newsletter. Call: M. Berman, (818)762-9966. [Exp. #105.]

CLIPPER

Los Angeles Clipper User Group. Meetings: 4th Wed., 6:30 pm, Culver City. Techy talk and speakers. Call: Louise Astorga, (818)886-1574. [Exp. #107.]

COMMODORE

C128 West Commodore 128 User Group. Meetings: Covina & Santa Monica. Free membership. Large disk library. Call: John, (818)331-1589; Paul, (818)892-3859; BBS, (714)598-1755 FidoNet. [Exp. #109.]

C-TUG (Commodore Technical User Group). Two meetings: 2nd Thurs., 2:00 pm, 2233 N. Tustin Ave., Orange, and 4th Sun., Seniro Citizen Center, 170 S. Olive. Speakers, demos, help with any Commodore and Amiga questions. Call: Lou Palush, (714)532-1802. [Exp. #109.]

Commodore Helpers Of Long Beach. Meetings: 2nd Sat., 9:00 am. St. Timothy's Lutheran Church, Woodruff and Arbor in Lakewood. Supports 64/128 models. Call: Tom Hoy, (310)424-0508. [Exp. #105.]

Orange County Commodore Club. Meetings: 4th Sat. Orange County Public Library, Park Ave. Branch, 1855 Park Ave., Costa Mesa. Call: Mike Moore, (714)668-9715. [Exp. #105.]

dBASE

LA FoxPro User Group. Meetings: 3rd Tues., 7:30 pm. All levels welcome. Call: Chuck, (310)539-9439. [Exp. #109.]

DESKTOP PUBLISHING

Southern California Ventura Publisher User Group (SC–VPUG). Meetings: Last Tues., 7:00 pm, 401 N. Brand, Glendale, Glendale Federal Bank Building. Product demos, Q&As, library resources. Call: (818)955-5830. [Exp. #107.]

EPSON

Epson UG/Orange County. Meetings: 3rd Sat, 10:00 am, 2151 Michelson near JW Airport, Irvine. QX, PX, CP/M, VALDOCS—support, tech, periodical & disk library, and parts. Call: (714)893-3305 [Exp. #110.]

IBM & COMPATIBLES

Greater South Bay PC User Group. Meetings: 2nd Thurs., 7:30 pm, Christ King Lutheran, 2706 W. 182nd St., Torrance. Visitors welcome. Call: (310)329-2804. BBS: (310)516-0834. [Exp. #107.]

Long Beach IBM PC And Compatibles User Group. Meetings: 3rd Wed, 7:00 pm, Los Altos Methodist Church, 5950 E. Willow St., Long Beach. Call: Jim Wells, (310)439-7114. [Exp. #109.]

Los Angeles Computer Society. Meetings: 2nd Tues., 7:00 pm, Culver City High School Cafeteria. Meetings are free and there are always live presentations and giveaways. Call: (310)473-6668. [Exp. #110.]

NOCCC Business & Spreadsheets SIG. Meetings: 1st Sun., 11:00 am, Chapman College, City of Orange. One of 22 SIGs. Call: (714)998-8080. BBS: (714)962-1857. [Exp. #108.]

Orange County IBM-PC Users Group. Meetings: 2nd Tues., 7:00 pm, Computer Learning Center, 1240 S. State College Blvd., Anaheim. Speakers, software, newsletter. Open to public, all welcome. Call: (714)990-0580. [Exp. #109.]

Public Domain User Group. 1000s of programs for IBM, CP/M, and Commodore computers. For catalog send SASE to: Zoltan Berbely, Disk & That, 1226 E. 7th St., Los Angeles, 90021. [Exp. #105.]

San Bernardino Personal Computer User Group. Meetings: Last Wed., 7:00 pm, CSU, San Bernardino, University Hall, Rm. 52. Just starting so need input on meeting topics and services desired. Call: Arthur Saltzman, (909)880-5755. [Exp. #110.]

Thousand Oaks Personal Computer Club (TOPCC). Meetings: 4th Thurs., 6:30 pm, Goebel Senior Adult Center, 1385 E. Janss Rd., Thousand Oaks. Call: (805)495-8325. [Exp. #109.]

TUG-NET. Meetings: 1st, 2nd & 3rd Thurs., 7:00 pm, Tektronix Corp., 21300 Erwin St., Woodland Hills. Enter through back door of building, press buzzer. Call: (818)249-1629. [Exp. #110.]

Valley Computer Club. Meetings: 1st Wed., 7:00 pm, Burbank Board of Realtors Bldg., 2006 W. Magnolia, Burbank. BBS, PD library, SIGs, newsletter. All welcome. Call: Wes Arnold, (213)221-4433; or Grayce Hruda, (818)842-3707. [Exp. #110.]

K-MAN

Southern California KnowledgeMan User Group. Meetings: 1st Wed., 7:00 pm, Honda North America, Bldg. 300, 700 Van Ness Ave., Torrance. Call: (213)662-9910. [Exp. #108.]

MACINTOSH

The American Film Institute Mac User Group (AFIMUG). Meetings: 2nd Mon., Apple Lab, AFI, Hollywood. TV, film, and video. Call: Dave Chadderdon, (213)856-7743. [Exp. #105.]

Los Angeles Macintosh Group (LAMG). Meetings: 3rd Thurs., 7:30 pm, Dept. of Water & Power, 111 N. Hope St. So. Cal's largest all-Mac user group meetings, monthly magazine, classes, PD software, and more. Call: (310)278-LAMG. [Exp. #109.]

Original Apple Corps, Macintosh User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #110.]

South Bay Apple Macintosh User Group. Meetings: Last Wed., 7:30 pm, Pacific Elementary School, 1214 Pacific Ave., Manhattan Beach. Call: (310)644-3315. [Exp. #105.]

NETWARE

Kern County NetWare Users Association. Meetings: 3rd Thurs. (no meetings in July, August, and December), 5:45 pm, Occidental Bldg., 1200 Discovery Way, Bakersfield. Call: William Morrison, (805)763-6933. [Exp. #105.]

NeXT

Southern California NeXTSTEP User Group. Meetings: throughout LA County. Call: Mike Mahoney, (310)985-1550 or Bob Desharnais, (213)343-2056. [Exp. #106.]

OS/2

LA OS/2 User Group. Meetings: 3rd Thur., 6:30 pm, IBM, 21041 Burbank Blvd., Woodland Hills. Call: Paul Duncanson, (805)584-8732. [Exp. #107.]

POWERBUILDER

Southern California PowerBuilder User Group. Meetings: 1st Tues. Technical presentations, networking, idea exchange. Call: (310)241-8181, ext. 36 or ext. 39. [Exp. #109.]

PROGRAMMING LANGUAGES

APL User Group—SoCal SIGAPL. Meetings: 2nd Wed., Los Angeles City College. Membership includes newsletter. Call: G. Smith, (213)560-2174. [Exp. #109.]

Forth Interest Group, Los Angeles Chapter. Meetings: 4th Sat., 10:00 am, Joslyn Center, 339 Sheldon St., El Segundo. Discussions, presentations, and tutorials include Forth, C, J, smalltalk, C++, OOP, hardware, algorithms, and operating systems. Call: John LuValle, (818)797-1820. [Exp. #109.]

TEXAS INSTRUMENTS

TI/944A Home Computer User Group. Meetings: 2nd Mon., 7:00 pm, Pomona First Federal, 9090 Central Ave., Montclair. Monthly newsletter, demos, and fairware. Call: (714)627-3403. [Exp. #105.]

UGOC. Meetings: 2nd Mon., Fidelity Federal, 13820 Seal Beach Blvd. Call: Joan, (714)633-5379. [Exp. #107.]

THEOS

THEOS User Group. Call: Fred Bellemy, (805)965-0265. [Exp. #105.]

UNIX

UNIX User Association Of Southern California. Meetings: 2nd Mon., 7:00 pm, New Horizons Learnings Center, 1231 E. Dyer Rd., Santa Ana. Call: Vince, (714)556-1220, ext. 126. [Exp. #106.]

VIDEO TOASTER

TUG—Toaster Users Group Of Orange County. Meetings: 3rd Thurs. Call: Bruce, (714)894-1777. [Exp. #106.]

VIRTUAL REALITY

Virtual Reality Special Interest Group (VRSIG). Meetings: The Electronic Cafe, 1649 18th St., Santa Monica. Call: Dave Blackburn, (310)545-0369. [Exp. #105.]

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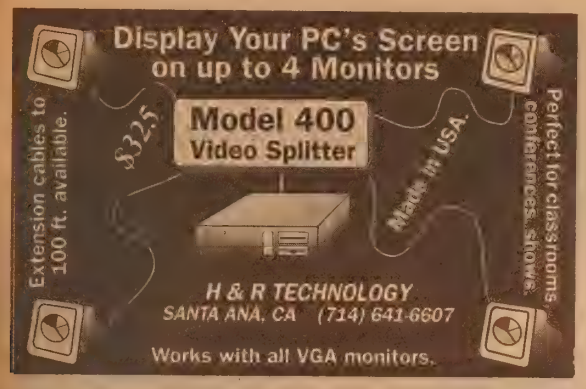
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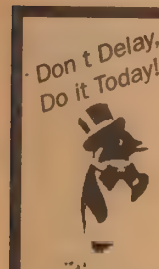

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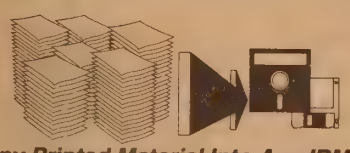

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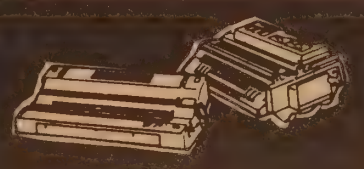

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Continued from page 45

("loop"), and the overhead involved in using function calls ("fcalle") in place of simple assignments ("fcalla"). The disk-intensive tests measure disk read ("dread"), disk write ("dwrite"), and pipe throughput ("pipes"). The "shell" test measures the system's multiuser capacity by running up to six concurrent sessions. Finally, the time required to compile the C source code for the other tests is included as a general measure of compiler efficiency.

If BSD is the only sort of UNIX that feels comfortable to you, Mach^{386} is a good way to feel at home on your 386 PC. The system generally behaves as expected, and little things like the BSD style of shuffling jobs between background and foreground count for a lot.

Mach^{386} is certainly not for everyone. Finding commercial applications that have been ported to Mach^{386} may be difficult, but it should do very well as a relatively inexpensive platform for a networked workstation. Source code for applications to run under 4.3BSD should compile without grief in the Mach^{386} environment, and there is no shortage of interesting software in the public domain.

Quite apart from either performance or utility, the distinguishing feature of Mach^{386} is its hybrid character. It is essentially a product in which new and old technologies are combined. Mach offers resources for multi-threaded programming and extends the use of client/server concepts to components of the operating system.

This hybridization is proceeding rapidly. Sitting on the desk is the packet of diskettes that make up Release 3.0 of Mach^{386}, in which the claims of new technology are made more forcefully. The new release relies on "microkernel" architecture to implement a system in which the user can move easily between operating environments as disparate as DOS and UNIX, and should make for very interesting reading next month. ■

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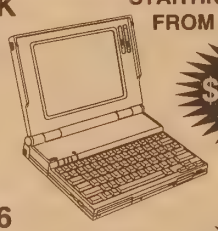

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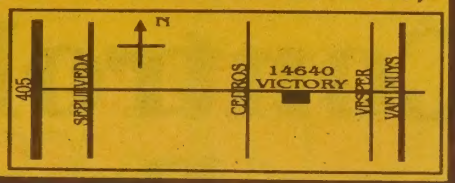

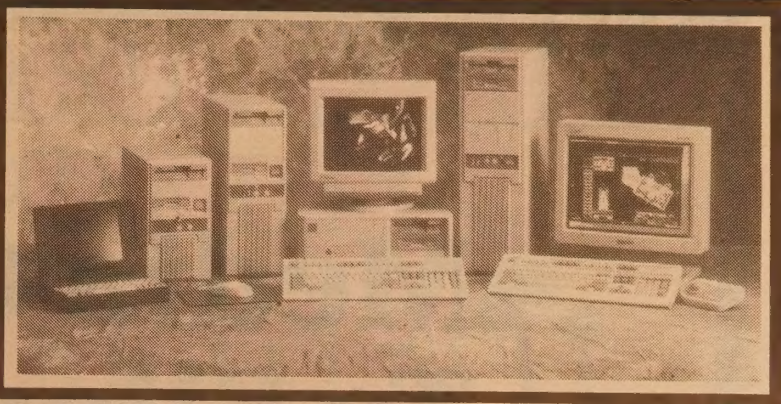

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Media Control Tries To Silence Dvorak

Or Who Really Writes These Columns, Anyway?

BY JOHN C. DVORAK

Last week I was called into the West Coast offices of Media Control.

If you haven't heard of Media Control, don't worry about it. Most Americans are subconsciously aware of the fact that the media are completely controlled by a secret government agency called Media Control. Every so often working writers are called in to be told what they should write about. Some write about pro-right-wing politics, some are given the opposite assignment. It's all designed to be transparent and to make it seem that writers are actually providing real news and information.

DVORAK'S LAST COLUMN

Of course every writer will deny the existence of Media Control. If they say it exists, they risk losing their job. When you see a once-famous writer disappear from the scene as if by magic, you can be sure Media Control was behind it.

People always ask me how can I write about Media Control and get away with it. Some time back a new West Coast head Control Master arrived in San Francisco, and I convinced him that it would be a good idea for me to discuss Media Control publicly, because nobody would believe it if I was the only one talking about it. I'd be perceived as a nutball of some sort. Anyway, the guy signed off a variance letting me discuss the organization.

When I'm given a particularly nasty assignment, such as pandering to some blowhard software company that apparently has connections with the government, I can pull out the variance and tell them that I'll write about Media Control and how I was given the assignment to do such-and-such.

Copyright © 1993 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

MY VISIT TO HEADQUARTERS

Which brings me to the point of this column. I got a call to visit Media Control a couple of weeks ago. It was a nonroutine visit. This meant I was in trouble.

The entrance to Media Control is underneath San Francisco's Chinatown in an old Tong tunnel. You get there on a special streetcar that runs under Market Street just below the BART tracks. Soon I was at the dock where two square-jawed government creeps escorted me into HQ. "Jenkins is really mad this time," said one of the goons.

These clowns are always making remarks to try to scare you. I paid no attention.

So I sat down at the desk of Jenkins Palmer III, a dweeb who is currently the Head Control of West Coast Media Control. They hired him a couple of years ago and I've always thought he was a creep. He doesn't like me much either.

He was standing in his office with his back turned to me looking at a map with a bunch of pins in it. He turned around. Sniffed, then scratched his nose and sat down.

"Apparently you're using OS/2. We want you to stop using it and use Windows exclusively."

"Why? I like OS/2."

"It goes against our plan. You can write about OS/2, but only from a Windows perspective. You should have gotten a memo about this months ago. It's a high-level decision. It's for the good of the country. This is final."

I was taken aback. "Good for the country? How's that?"

"You don't think we made Bill Gates a billionaire for nothing do you? Microsoft has been picked to rule the software industry and Gates dances to our tune."

"What about the FTC deal?"

"What about it? It's designed to be appealed. Nothing will come of it for years. Look, Dvorak, let me just say that you'll never understand what we do here, or why. It's not your job. Just suffice it to say that Microsoft is categorized as Class 1AA—meaning they are run by us in Media Control. Use Windows!!"

"The Windows under OS/2 works fine for me."

"You're going to be B-listed if you don't change tomorrow."

His phone buzzed and he picked it up and mumbled something into it. "I'll be right back," he said as he hurriedly took off.

On the desk was a Microsoft file. I quickly grabbed it, knowing that there were no cameras watching me in that office. It was titled "logo design." It was the old plans for the current Windows logo. I looked in shock—the Windows logo is a carefully hidden swastika! Look for yourself!

I began to read the memo in the folder about the "hidden sign"! Wow, this is really weird, I thought to myself.

Before I could read further I heard Palmer coming back and quickly put the folder back.

"Apparently you're using OS/2. We want you to stop using it and use Windows exclusively."

"Why? I like OS/2."

"It goes against our plan. You can write about OS/2, but only from a Windows perspective. You should have gotten a memo about this months ago. It's a high-level decision. It's for the good of the country. This is final."

"Now get out of here!" screeched Palmer.

When I got home OS/2 was erased from my machine, and on the screen loomed the Microsoft logo. I reinstalled OS/2.

There's a lot more to this story, but unfortunately there's someone downstairs pounding on the door... ■

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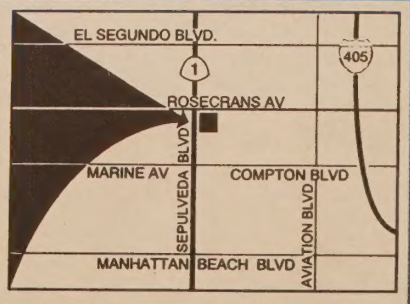

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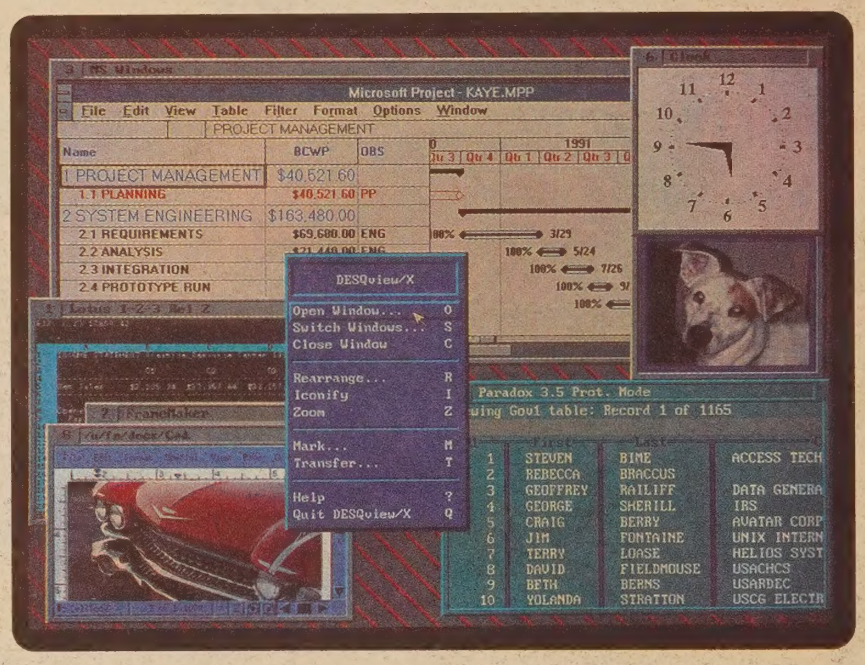

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